ELECTRICAL WEST

July 1948
25 cents

Rationalized Power Development, Page 55

Appliances, Page 71

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U. S.

New Electric Water Heaters ARE CHEAP TO
ELECTRICAL LIVING is out in front!
New Electric Ranges ARE CHEAP TO OPERATE
AT YOUR DEALERS
SOUTHERN CALIFORNIA EDISON COMPANY
HERE'S the Key to More Electric Water Heater Sales...
Electric cooking gives better
Another reason ELECTRICAL LIVING is out in front!
Come in and see the NEW ELECTRIC RANGES

PULLING FOR big sales OF NEW ELECTRIC RANGES AND WATER HEATERS!

"Electrical Living is out in front!" A striking new Edison promotion built around this theme is currently boosting electric range and water heater sales throughout Southern and Central California.

It's a big campaign—including newspaper and magazine advertisements, direct mail to 500,000 homes, and dealer helps such as banners for windows and store interiors, price tags, sales manuals — aimed at a $25,000,000 market.

Interested customers are brought into your store by every Edison advertisement. Each one points out that new electric ranges and water heaters are "Available Now at Your Dealers." As always, Edison tells them and the dealer sells them!

Edison *Southern California Edison Company*

353 MAN-YEARS TO CREATE A BETTER WATTHOUR METER

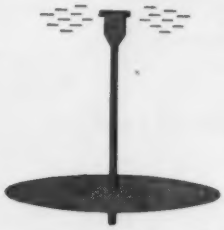
I. F. KINNARD
Manager of Engineering
Meter and Instruments
Divisions
West Lynn, Massachusetts

type I-50 COMBINES ACCURACY WITH LOW MAINTENANCE COSTS

To create a watthour meter having longer life and lower maintenance costs than present models, has taken a tremendous amount of time and money. Some of the time spent includes 42 man-years for engineering and drafting, 24 man-years for laboratory testing, 35 man-years on samples and special work for engineers, and 252 man-years on tools for production.

All this effort, plus previously accumulated knowledge, has resulted in the I-50 watthour meter—the first completely new meter in fifty years. Features like magnetic suspension of the moving element, die-cast control magnets, and polyethylene and butyl insulation contribute to the remarkable performance of the I-50.

For six years, we've been running test meters night and day at ten times normal load. Some of them have made as many as 75 million revolutions, the equivalent of 65 years of service, yet show no signs of breakdown. That's our answer to the plea for lower maintenance costs.



ELIMINATED

- Bearing maintenance
- High-pressure end bearings
- All bearing lubrication

IMPROVED

- Stability of calibration
- Insulation
- Corrosion resistance

SIMPLICITY OF CONSTRUCTION contributes to the accuracy, long life, and low maintenance costs of the I-50. This simplicity is the result of these new features which are each self-contained units:

No other meter has ever combined so many desirable features.

1. Magnetically suspended moving element to do away with bearing maintenance.
2. Simplified registers to make reading easier.
3. Damping magnets die-cast in frame to assure calibration stability.
4. Improved—co-ordinated—insulation to assure longer life.
5. One-piece molded "s" base to minimize corrosion.

All these features—and more—make the I-50, both in the socket- and front-connected types, a completely new meter. Its production will, for the time being, supplement that of our regular I-30 meter. This will result in a production increase of about 15% for 1948. Your nearest G-E representative will be happy to supply more details. Or write today for Bulletin GEA-5050. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

GENERAL ELECTRIC

601-26

JULY
1948

SPOKESMAN FOR MOST HIGHLY ELECTRIFIED REGION OF THE U. S.
The all-industry magazine of progress, established 1887, and incorporating the "Electrical Journal", "Journal of Electricity, Power and Gas" and "Journal of Electricity". Contents Copyright. Sixty-first year of publication.

ELECTRICAL WEST

James H. McGraw (1860-1948), Founder
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IN AUGUST

Water always has been pretty important to life, despite the gags to the contrary, and in the often arid West it is especially important. This year with too little in the Southwest and too much in the Northwest, and with populations and industries flocking westward, all requiring more water, the question of weather and water has to get out of the talk stages of doing nothing and into some action. Prof. Folsom made a well-reasoned analysis of the whole thing at the PCEA convention. His paper will be printed here next month.

Two Portland newspapers ran a race to provide themselves with a new building and new presses. The electrical plans were handled by the same engineers—and a story on the similarities and the differences in these two big jobs will be told.

As always the engineering pages will be full of pictured ideas and developments, the lighting and wiring pages will treat of new techniques and trends in wiring rules, methods and practical contracting policy. The sales pages will report San Diego's whirlwind sales conference and its News Letter tell quickly the selling news of the time. Association reports will tell significant things done or said at industry meetings. The news will interpret industry events.

As always the editors will strive for a well balanced diet for the entire industry.

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Cover photo: Lighting at the Olympic Colosseum in Los Angeles.

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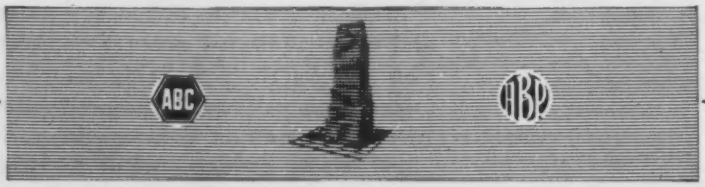

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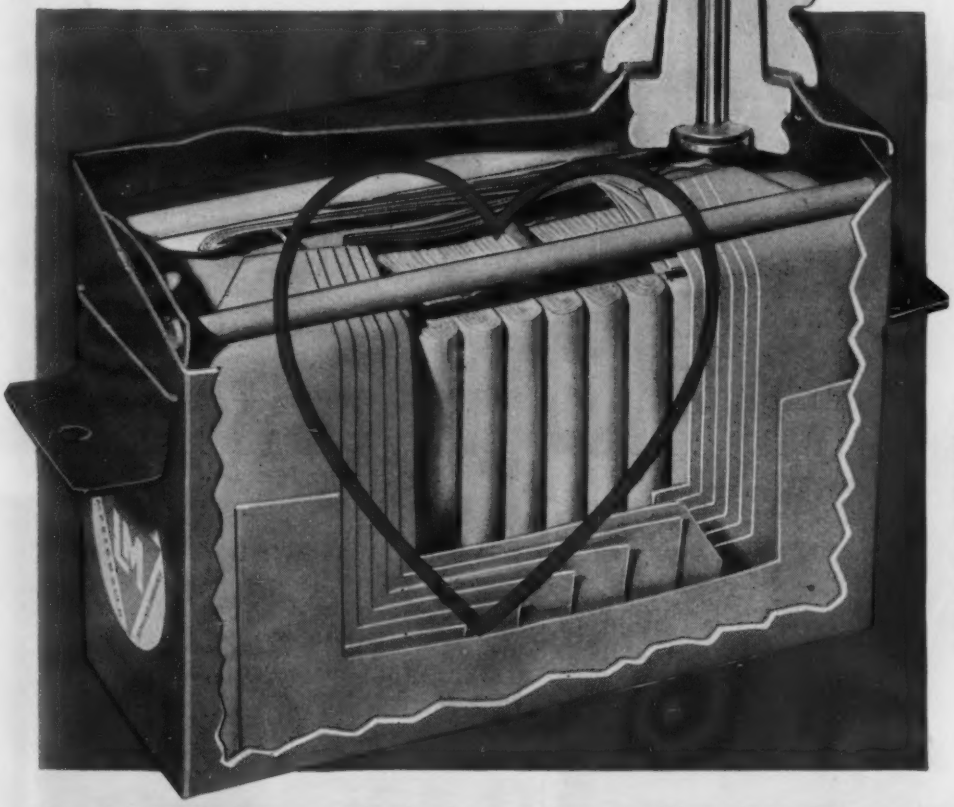
INDIVIDUAL CONTROL

an advanced manufacturing method assuring greater uniformity, far less chance for premature failure of distribution capacitors.

assures long life for

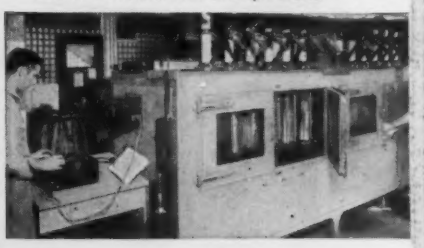
Elemex shunt capacitors

During the years of development and service testing of "ELEMEX" distribution capacitors, Line Material research laboratories also developed a new method of manufacturing. This new method applies the desired economies of mass production but provides constant individual control and continuous individual testing during evacuation, drying, and during L-M's unique impregnation with "ELEMEX" liquid. A few steps in the process are shown in the illustrations. Why not get the *whole* story—in the booklet "ELEMEX" Capacitors"? **Write Line Material Company, Capacitor Division, Milwaukee 1, Wisconsin.**



Packs are individually tested for dielectric strength, before assembly. With this test it is impossible for an inferior pack to get into the production line.

Individual leak test, under water, with 15 pounds pressure inside of capacitor tank, assures absolute seal of capacitors.



Continuous testing, during the evacuation, drying, and impregnation of individual units, assures precise control of power factor and capacitance of each capacitor.

Individual over-voltage test of pack insulation and major insulation—one of five separate tests and inspections made after production has been completed.

LINE MATERIAL Capacitors

COMPLETE EQUIPMENT FOR ALL DISTRIBUTION REQUIREMENTS

Where rubber cable must fight OIL-WATER-SUN-HEAT-OZONE-ABRASION

CONSTANT FLEXING

plays hob with some cables but Amerclad is built to give unfailing service under conditions like this.

LIGHTNESS,

flexibility and high resistance to heat and abrasion are combined in Amerclad Welding Cable.

SEVERE ABRASION,

immersion in acid mine water and contact with oil and grease do not damage Amerclad Portable Machine Cables.

LONG SERVICE

under rough usage and exposure to oil make Amerclad Cords first choice for portable tools.

—YOU NEED U·S·S AMERCLAD

IF you make or use electrical equipment that operates under any of the above conditions, you should consider U·S·S Amerclad Rubber Covered Cords and Cables.

Oil-resisting Amerclad Cables are made with a Neoprene cover which doesn't swell when exposed to oil or grease.

Water can't penetrate the live rubber covers. That's why so many Amerclad Cables are used on dredges, mining machines, trolley buses and other portable equipment.

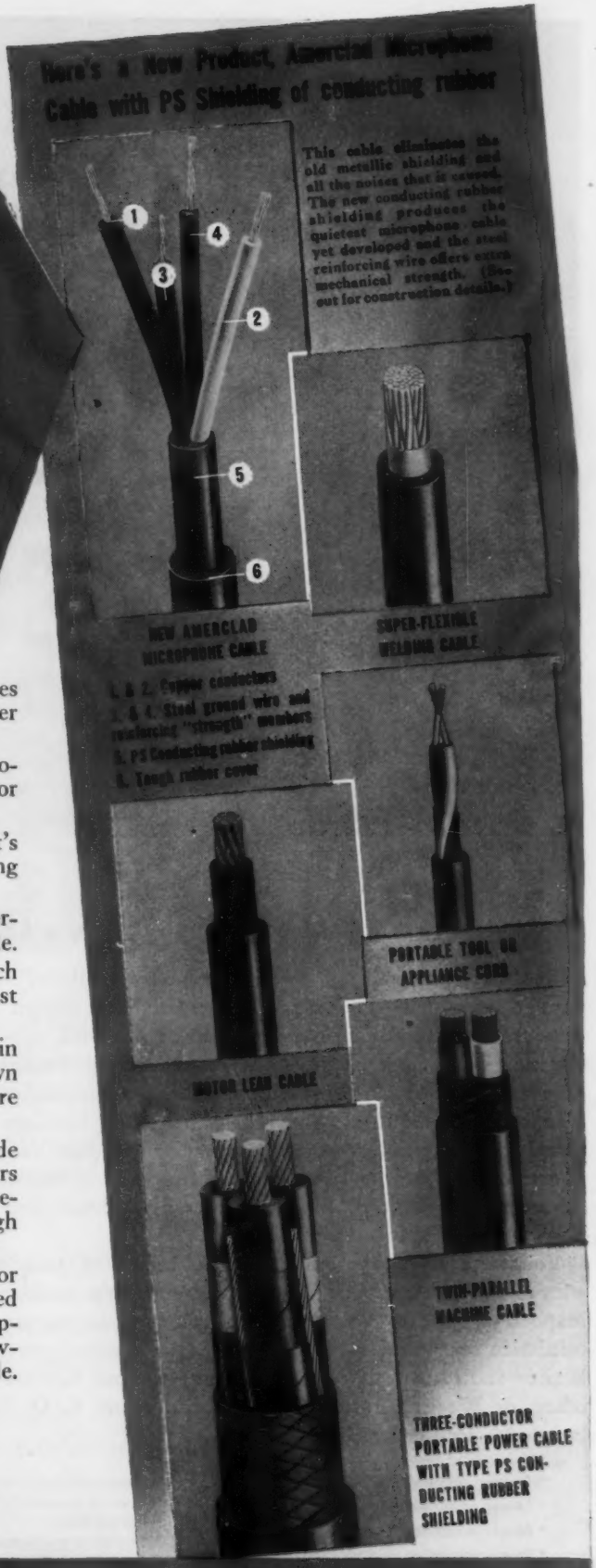
Sunshine won't crack the specially compounded Amerclad covers so that this cable can be used outdoors or inside.

Heat and flame resistance of Amerclad Cables is such that they easily pass the State of Pennsylvania flame test for mining cables.

Ozone troubles at higher voltages are prevented in Amerclad Cables by use of conducting rubber tape known as PS Shielding, a development of American Steel and Wire Company engineers.

Abrasion Resistance of Amerclad Cables has made them famous throughout industry. No other rubber covers surpass Amerclad in toughness — they are made of "tire-tread" rubber and can be dragged over sharp rock or rough floors without damage.

Applications. Amerclad cables are especially built for portable machinery and tools of all kinds. They are used for motor and generator leads, machine tools, welders, appliances, mining machinery—wherever a sturdy rubber covered cable is needed for long life and freedom from trouble.

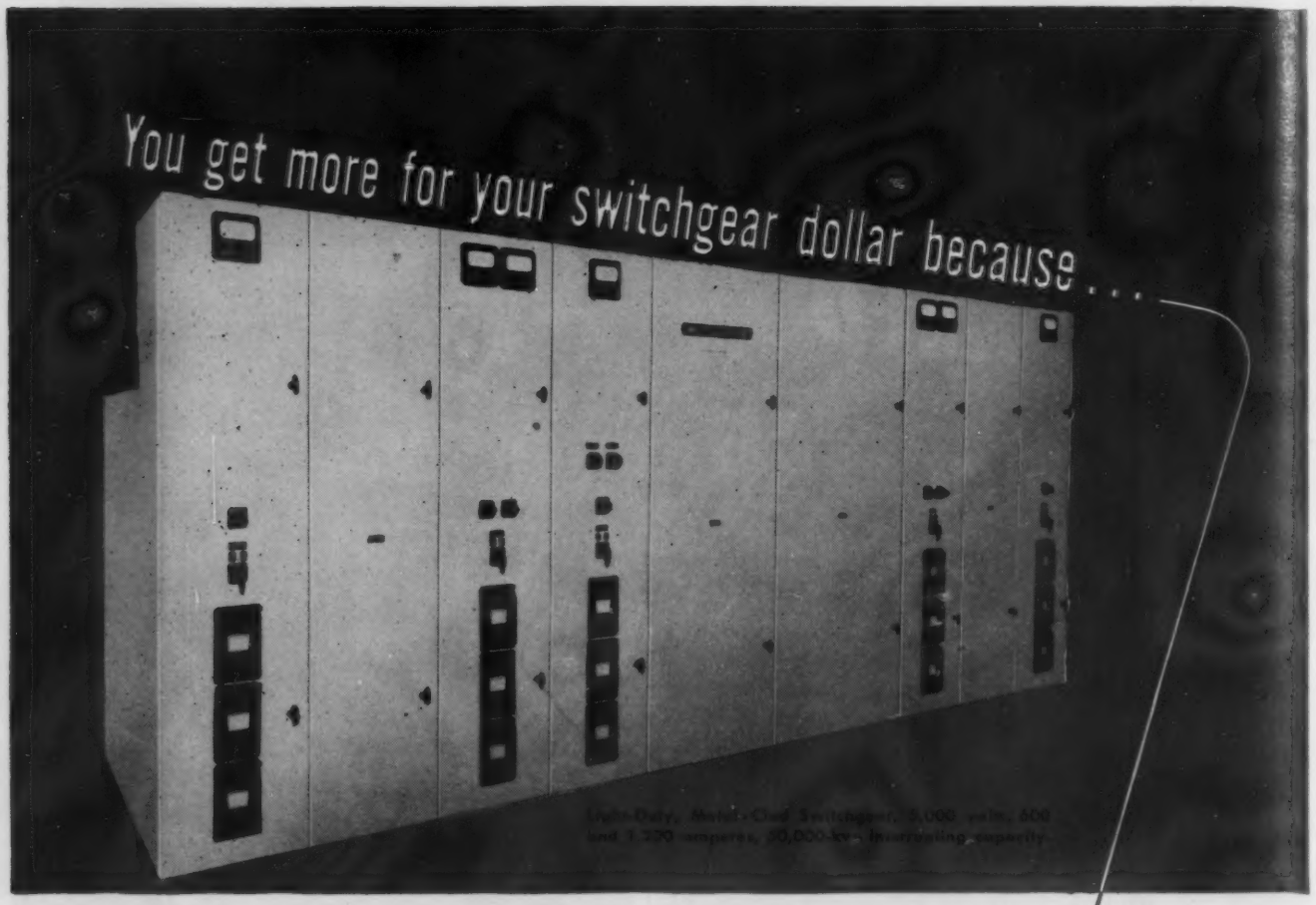

Here's a New Product, Amerclad Microphone Cable with PS Shielding of conducting rubber
This cable eliminates the old metallic shielding and all the noises that it caused. The new conducting rubber shielding produces the quietest microphone cable yet developed and the steel reinforcing wire offers extra mechanical strength. (See cut for construction details.)
1
2
3
4
5
6
NEW AMERCLAD MICROPHONE CABLE
1 & 2. Copper conductors
3 & 4. Steel ground wire and reinforcing "strength" members
5. PS Conducting rubber shielding
6. Tough rubber cover
SUPER-FLEXIBLE WELDING CABLE
PORTABLE TOOL OR APPLIANCE CORD
MOTOR LEAD CABLE
TWIN-PARALLEL MACHINE CABLE
THREE-CONDUCTOR PORTABLE POWER CABLE WITH TYPE PS CONDUCTING RUBBER SHIELDING

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

AMERCLAD CABLES

UNITED STATES STEEL

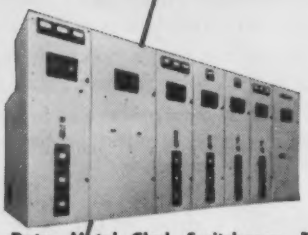


it's a case of savings . . . times 4!

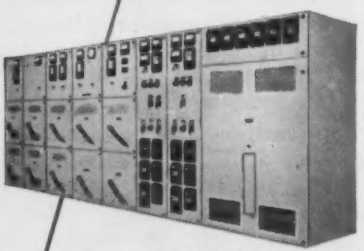
When you standardize with Westinghouse Unitized Switchgear, you save in 4 ways: **First,** because its standardized design eliminates the expense incurred in preparing bills of material, specifications, and engineering on special design features. **Second,** because standardized manufacturing methods permit cuts in production costs, which, in turn, are reflected in a lower unit price. **Third,** because installation is simple and requires no specialized equipment and handling. Uniform construction permits planning conduit and foundation layouts in advance. **Fourth,** complete factory assembly reduces your job to making a few simple connections.

You save after operation begins, too. The standardized design affords easy accessibility to component parts and reduces breaker inspection time to a few minutes. These features—and others—that minimize operating costs are covered in booklets currently available. Write—indicating your requirements—to your nearest Westinghouse office, or Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.

J-60668



Heavy-Duty, Metal-Clad Switchgear, 5,000 to 15,000 volts, 600 to 2,000 amperes, 150,000 to 500,000 kva interrupting capacity.



Low-Voltage, Metal-Enclosed Switchgear, 600 volts maximum, 15 to 6,000 amperes, 15,000 to 100,000-amp interrupting capacity.

- Lower planning and ordering costs
- Lower manufactured cost
- Lower installation cost
- Lower operation and maintenance costs
- Greater service continuity
- Greater safety
- Greater versatility
- Longer life
- Shorter manufacturing time
- Superior equipment for outdoor requirements

IT'S STANDARDIZED!

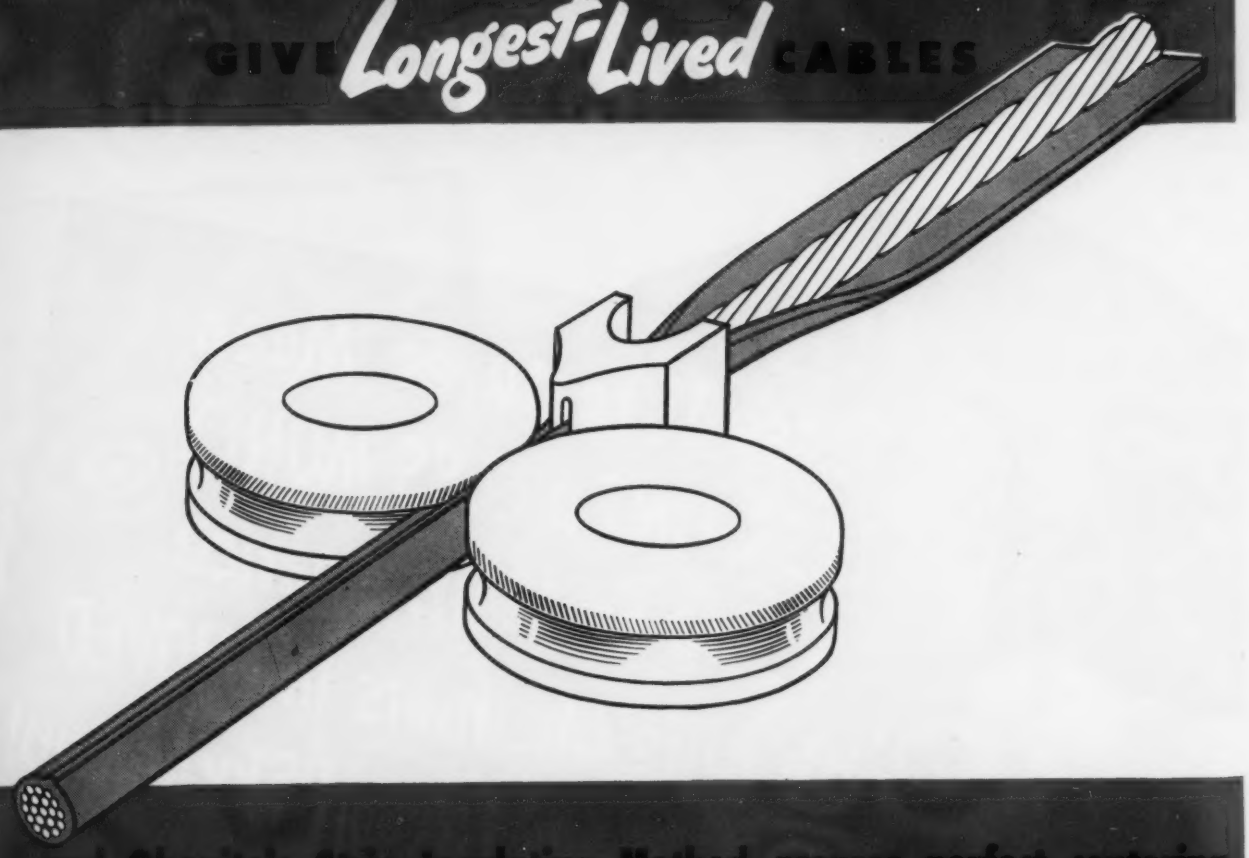
Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

UNITIZED SWITCHGEAR

INDOOR AND OUTDOOR SERVICE

ONLY PERFECTLY-CENTERED CONDUCTORS GIVE *Longest-Lived* CABLES



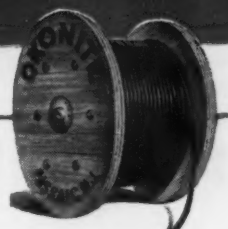
...and Okonite's Strip Insulating Method assures perfect centering

The Okonite Strip Insulating Method is the only process that provides perfect centering of conductors and at the same time permits inspection of every foot of insulation during the entire application operation.

Here's what happens. Precisely-measured, smoothly-calendered strips of rubber compound pass through "covering wheels" and are individually folded around the conductor.

This procedure provides automatic centering. It eliminates uneven walls of insulation. And as a result, the Okonite Strip Method removes every chance of electrical failure from imperfect centering. The process is the same for all layers, except that the outside layer is backed with a pure tin sheet, forming a continuous metal mold to assure uniform vulcanizing.

Bulletin 101 gives you further information on the Up-River Fine Para rubber used in Okonite insulation as well as data on many manufacturing steps taken only by Okonite to build user-benefits into longest-lived electrical wires and cables. Write for it to The Okonite Company, Passaic, New Jersey.



with today's installation costs* only the *Longest-Lived* will be economical

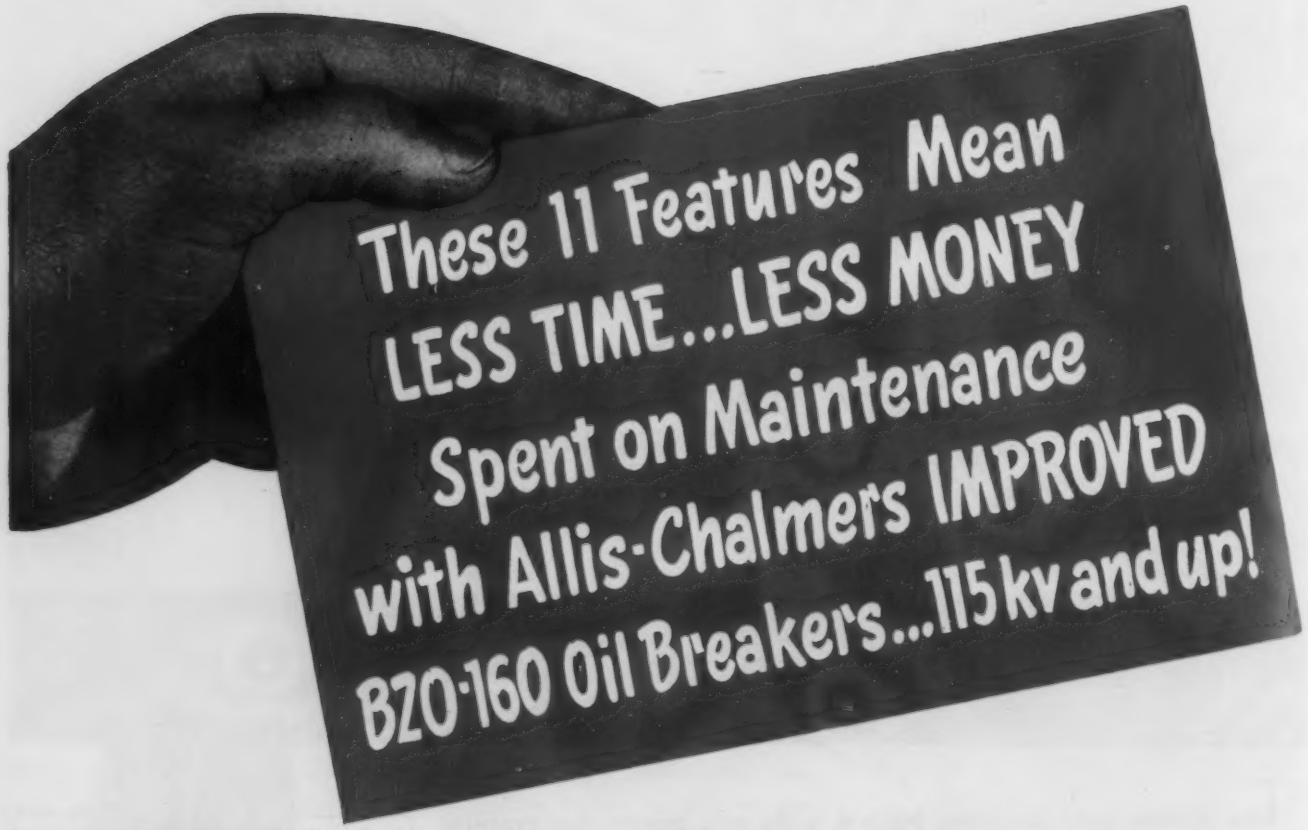
*The lifetime cost of a cable rather than its first cost is the only true measure. Okonite wires and cables, built to stand up better and longer, can offset high installation costs.

6508

OKONITE SINCE 1878 **insulated wires and cables**

THE BEST CABLE IS YOUR BEST POLICY

COUNT 11 and



Get Reliable . . . Long Life Breaker Operation!

MAINTAIN YOUR STANDARDS of service with "5-20" or "3-20" performance . . . interruption in 5 or 3 cycles, reclosing in 20! You get that protection in ratings 115 kv and higher by installing Allis-Chalmers improved BZO-160 oil circuit breakers.

REDUCES CONTACT MAINTENANCE

TWO *RUPTOR* interrupters assure fast, positive interruption! They are based on standard Allis-Chalmers design known for low arc energy interruption that means long contact life and low oil deterioration. Simple design, free of complicated mechanisms and serious alignment problems, permits quick contact inspection.

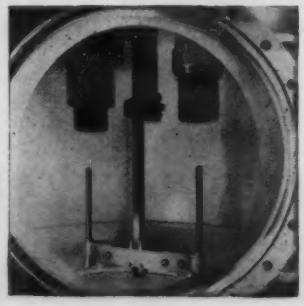
IMPROVED HIGH SPEED PNEUMATIC OPERATOR, with fast magnetic trip, aids high speed contact separation . . . provides 20-cycle reclosing that helps you maintain better service continuity and system stability. It is mechanically trip-free . . . assures instantaneous reopening should breaker close on a fault!

BUILT FOR LONG LIFE

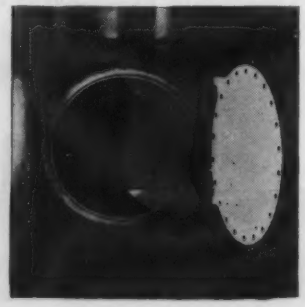
CAREFULLY SELECTED MATERIALS for all parts, from tanks to contacts, minimize chance for mechanical failures . . . reduce number of routine inspections.

For more complete information on the BZO-160 outdoor oil circuit breaker, contact your nearby A-C office for literature, or write ALLIS-CHALMERS, MILWAUKEE 1, WIS. *Ruptor* is an Allis-Chalmers trademark. A 2347

1 ***RUPTOR*** **INTERRUPTERS are easily dismantled for inspection when necessary . . . as indicated by condition of bayonet contact tips.**



2 **STURDY TANKS have large manholes with hinged covers . . . means easy access to tank interior and *Ruptor* interrupters.**



Save 2 Ways!

1. Simplified contact groups speed contact inspections.

2. Large manhole with hinged cover permits easy access to tank interior.

3. Double-hinged doors uncover operator and allied equipment on 3 sides.

4. Removable hood allows speedy adjustments of pole unit mechanism and transformer connections.

5. Bushing transformers in wells . . . removed from top or down through tank without removing bushings.

6. Fill valve (top) and combined drain and sampling valve for oil handling.

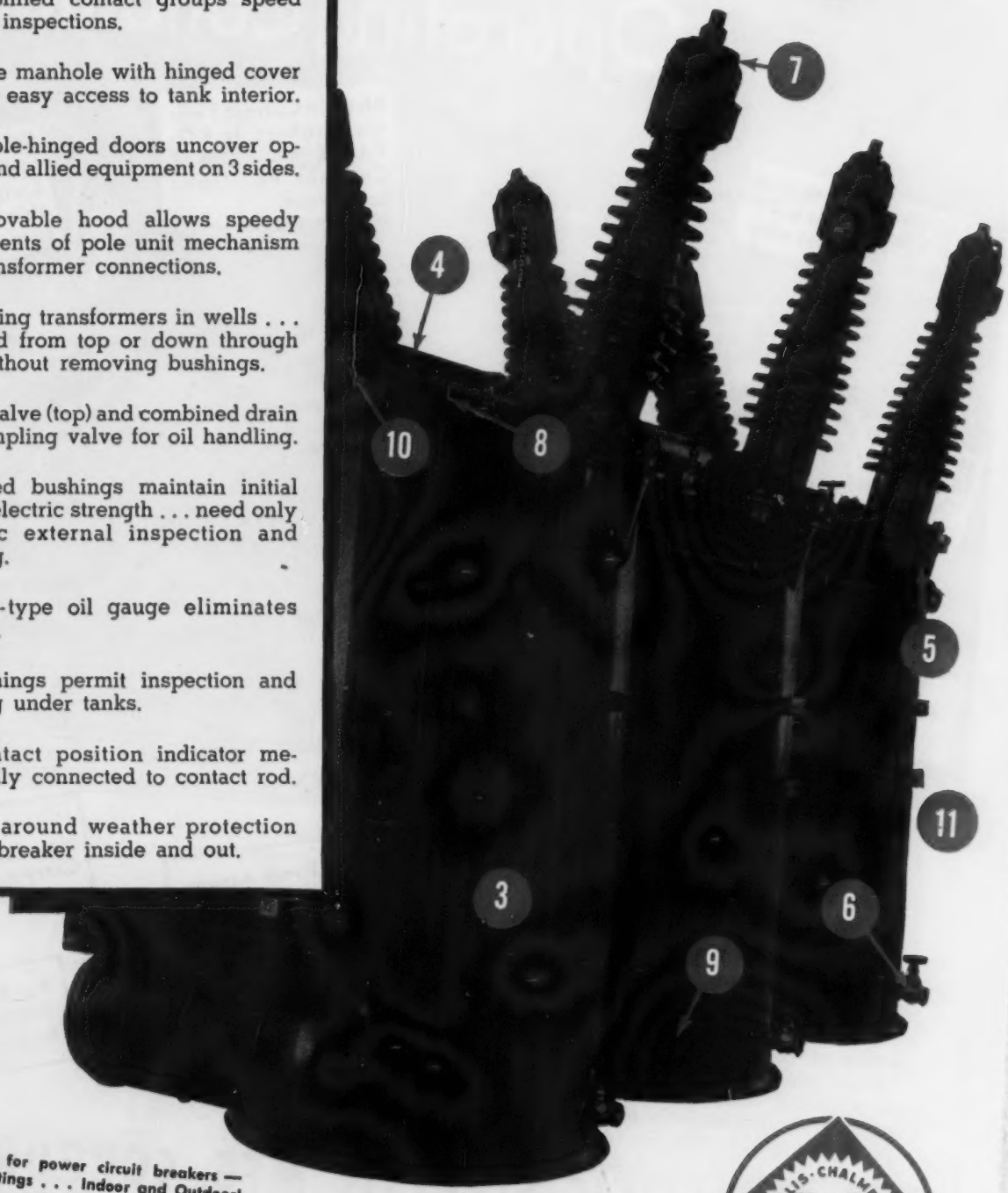
7. Sealed bushings maintain initial high dielectric strength . . . need only periodic external inspection and cleaning.

8. Float-type oil gauge eliminates leakage.

9. Openings permit inspection and cleaning under tanks.

10. Contact position indicator mechanically connected to contact rod.

11. All-around weather protection guards breaker inside and out.



Call Allis-Chalmers for power circuit breakers — in standard ASA ratings . . . Indoor and Outdoor!

ALLIS-CHALMERS

Pioneers in Power and Electrical Equipment From Generation Through Utilization

Engineered and Tested for TOUGH Operating Conditions

Superior Performance for Disconnecting, By-pass or Sectionalizing.
Blade in Correct Position before it ROTATES In and Out of Contact Position; Less Wear.
Solid-Silver-to-Solid-Silver Easily-Adjustable High-Pressure Contacts.
NEMA BIL Insulators & Open-Gap Spacings.
PACIFIC ELECTRIC
Rotating Blade
Air-Break Switch
Type TW
7.5 kv. to 230 kv.;
400, 600 and 1200 amps.
Gang Operated, Rotating Insulator, Vertical Break. Suitable for Horizontal-Upright or Inverted Mounting. Vertical Mounting to 161 kv.
Widely-spaced Bearings for Rotating Insulator.
Hinge End has Bevel-Link Drive, Operating Lever and Link, for Simple, Positive Operation.
Stiff Bases Assure Perfect Alignment.
High Conductivity, Non-ferrous Current-Carrying Parts.

Utilities everywhere rely upon this switch because it is dependable under severe operating conditions. It is of simple design, toggles in closed position, has enclosed spring to counterbalance the blade of larger sizes, and easy adjustments: for positioning the blade and for rotating the blade. Manual and automatic controls available. Meets all A.I.E.E. and N.E.M.A. Standards.

For Full Details, See Our Bulletin No. 82.

Call **PACIFIC ELECTRIC MFG. CORPORATION**

5815 THIRD STREET, SAN FRANCISCO 24, CALIFORNIA • P. O. BOX 419, GARY, INDIANA

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G. B. KIRKWOOD, 437 S. Hill St., Los Angeles 13, Calif.
WILLIAMSON & WILMER, INC., 617 Mutual Bldg., Richmond 19, Va.
HAWORTH L. BRUECK CO., 53 W. Jackson Blvd., Chicago 4, Ill.
PIERCE G. FREDERICKS, 90 West St., New York 6, N. Y.
A. A. MARRS, 526 Dwight Bldg., Kansas City 6, Mo.
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F. W. GORMAN, P. O. Box 223, El Paso, Texas
H. R. SLOCUM CO., 304 Damon Bldg., Honolulu 1, T. H.
J. E. REDMOND CO., 400 W. Madison St., Phoenix, Ariz.

Other Representatives in Principal Cities

General Electric Announces

2 ALL-NEW Time-Delay Fuses

THAT MAKE YOUR PROTECTION EXTRA SURE!

all-new

FERRULE FUSE

This easy-to-renew fuse has a combination of *protection* features and *convenience* features such as you've never had before. Thanks to a newly designed fuse link perfected by General Electric research, protection from harmful overloads is quick and sure—yet, limited transient overloads won't cause unnecessary "blows."

It's a timesaver, too. Only three parts enclose the link. Alignment takes care of itself when a new link is slipped in place. It can't be assembled with the link off-center or under strain. Caps come off and go on by hand. A new label makes identification easy.

You'll be buying these fuses in ratings from 3 to 60 amperes, for 250- or 600-volt requirements. Order a trial lot from your electrical supply house now, and watch them pay off as "headache preventers."

all-new

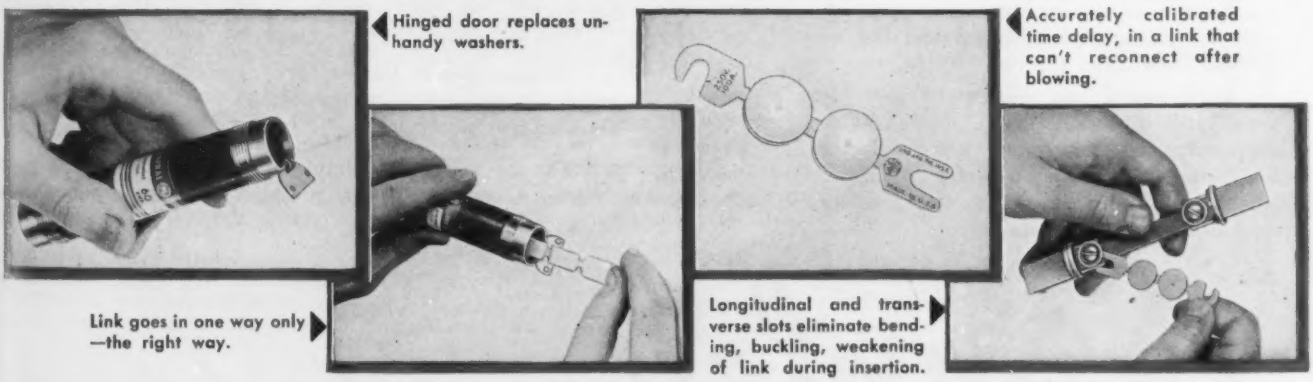
KNIFE-BLADE FUSE

You won't know which to rate "tops" in this design: the new time-delay link, or the sturdy assembly that makes such short work of renewal. Just remove one end-cap, and the fuse is disassembled. Screws can't fall out, and cup-shaped washers guide the link into place. The heavy-fiber bar-support is securely anchored to the blades. Alignment is bound to be right, even on large size fuses with more than one link.

Notice the disk design of the link sections. No chance here for "blown" link sections to overlap and re-establish contact.

This new fuse line includes ratings from 70 to 600 amperes, for 250- or 600-volt service. Try them once and you'll want them as your *first-choice* fuses.

For facts on new G-E fuses write to Section D13-725, Construction Materials Department, General Electric Company, Bridgeport 2, Connecticut.


Hinged door replaces unhandy washers.
Accurately calibrated time delay, in a link that can't reconnect after blowing.
Link goes in one way only—the right way.
Longitudinal and transverse slots eliminate bending, buckling, weakening of link during insertion.

GENERAL ELECTRIC

A new catalog of Simplex Aerial Cables is now ready for printing. Within a few weeks it will be ready for distribution. You will want a copy. A request now will insure your getting one as soon as it is ready.

In it we describe different types of Simplex cables suitable for aerial installation and the benefits to be derived from each type.

Furthermore, we discuss at some length the three usual types of installation (1) messenger and ring, (2) self-supporting with messenger and conductors assembled at the factory, (3) the more recent "Spinner" type where the messenger is first installed and prestressed before the conductors are lashed to it.

The third method has been used by the telephone companies with good results for a number of years. It has more recently been used for power cables but is proving equally successful in that field. It is also suitable for police and fire alarm cables. It combines the advantages of both the older types.

Simplex Aerial Cables for "Spinner" types of installation are proving to be economical to install and entirely satisfactory in service.

Let us send the Simplex Aerial Cable Catalog as soon as it comes from the press. A post card request will bring it to you.

Simplex

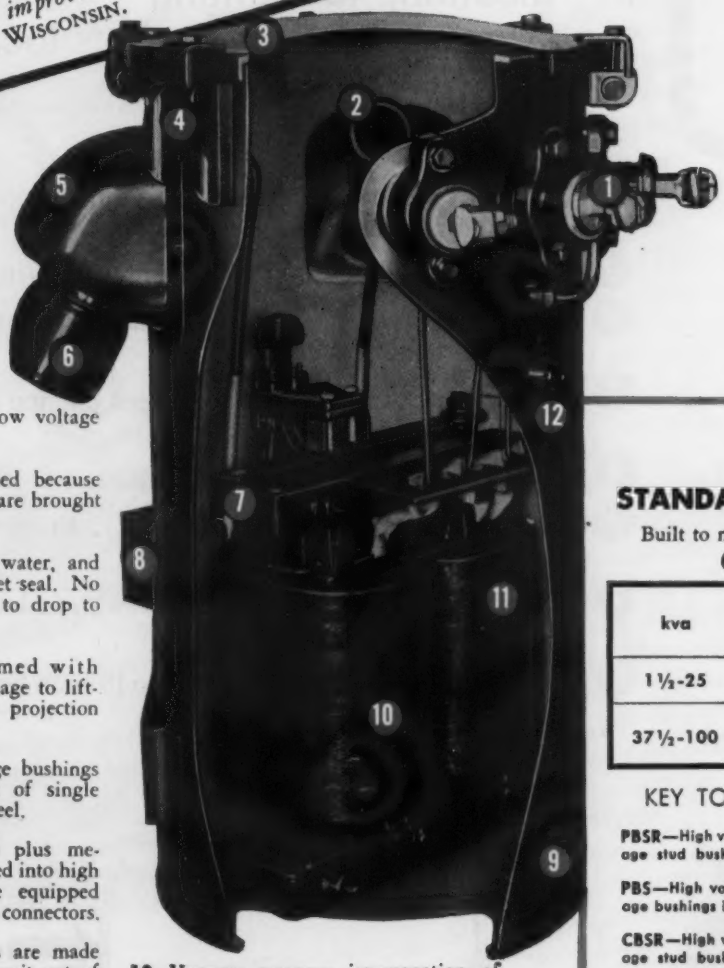
WIRES & CABLES

SIMPLEX WIRE & CABLE CO., 79 SIDNEY ST., CAMBRIDGE 39, MASS.

X-Ray View

SHOWS STURDINESS OF ALLIS-CHALMERS DISTRIBUTION TRANSFORMERS

IT'S EASIER TO HANDLE, install these *improved* distribution transformers. And they're better looking! Why? New preferred oriented electrical core steel is the big reason. From 17% to 39% in weight and up to 33% in size is saved. And these improvements are made without loss of mechanical or operating characteristics. Check the "X-Ray" view for construction details of these *improved* units. ALLIS-CHALMERS, MILWAUKEE 1, WISCONSIN. A 2404



1. Externally replaceable low voltage bushings.

2. Internal flashover prevented because high voltage bushing shanks are brought well into the tank.

3. Cover is domed to shed water, and formed to assure correct gasket seal. No loose parts on cover clamps to drop to ground.

4. Lifting hooks are formed with smoothed edges to avoid damage to lifting ropes. All hardware is projection welded to tank.

5. Protection for high voltage bushings provided by bushing pocket of single piece special deep-drawing steel.

6. Liberal creepage distance plus mechanical strength are engineered into high voltage bushings. They are equipped with vibration-proof solderless connectors.

7. "Easy-to-get-at" provisions are made for lifting the core and coil unit out of the tank.

8. Standard mounting—EEI-NEMA lugs with standardized mounting dimensions are supplied.

9. Use of corrosion resistant finish cuts maintenance. Tank is first Spra-Bonderized. Then 3 coats of weather-resistant paint are separately baked on.

10. Vacuum pressure impregnation of core and coil element permanently seals and strengthens the winding.

11. Rigid inspection and electrical tests assure trouble-free operation.

12. Testing of tanks at high pressure insures oil tightness.

SEND FOR BULLETIN 61B6159B on distribution transformers — 1½-100 kva, 2400-15,000 v.

STANDARDIZED DESIGNS

Built to meet EEI-NEMA Standards
(*Preferred types)

kva	4800 volts and below	7200 volts and up
1½-25	*PBSR	*CBSR or PBSR
37½-100	*PBS	*CBS

KEY TO TYPE DESIGNATION

PBSR—High voltage pocket bushings with low voltage stud bushings in tank wall . . . round tank.

PBS—High voltage pocket bushing with low voltage bushings in tank wall . . . semi-elliptical tank.

CBSR—High voltage cover bushings with low voltage stud bushings in tank wall . . . round tank.

CBS — High voltage cover bushings with low voltage stud bushings in tank wall . . . semi-elliptical tank.

ALLIS-CHALMERS

Pioneers in Power and Electrical Equipment From Generation Through Utilization

CROUSE-HINDS

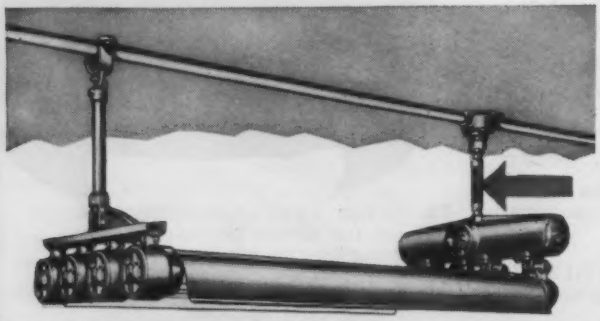
Explosion-Proof and Dust-Tight

Flexible Fixture Supports

provide a neat and economical mounting for lighting fixtures in hazardous locations

They comply with the requirements of Article 500, 1947 National Electrical Code, which specifies a flexible connector in fixture stems over 12 inches long.

1. **Compact streamlined design** .... just slightly larger than the conduit.
2. **Permanently flexible** .... no moving parts.
3. **Self-aligning** .... fixture stem will always be exactly vertical.
4. **Protection** .... flexibility minimizes chance of mechanical injury to the fixture.
5. **Insulating lining** in the flexible part.
6. **Varied nipple arrangements** .... to meet every requirement.
7. **Set screws in all female nipples** .... lock against rotation.
8. **Full range of sizes** .... 4-inch to 18-inch flexible length.



Crouse-Hinds Type EVF Explosion-Proof 4-Lamp Fluorescent Fixture Suspended by ECHF Flexible Fixture Support.

Type ECJF Two Female Nipples

Type ECHF Two Male Nipples

Type ECGF One Female Nipple, One Male Nipple

Type ECKF One Female Union, One Male Nipple

CROUSE-HINDS COMPANY
Syracuse 1, N. Y.

Crouse-Hinds Type EVA Explosion-Proof Fixture Suspended from GUFT Condulet and GUA Canopy by ECGF Flexible Fixture Support and Conduit Stem

Offices: Birmingham – Boston – Buffalo – Chicago – Cincinnati – Cleveland – Dallas
Denver – Detroit – Houston – Indianapolis – Kansas City – Los Angeles
Milwaukee – Minneapolis – New York – Philadelphia – Pittsburgh
Portland, Ore. – San Francisco – Seattle – St. Louis – Washington.
Resident Representatives: Albany – Atlanta – Charlotte – New Orleans – Richmond, Va.
CROUSE-HINDS COMPANY OF CANADA, LTD., *Main Office and Plant:* TORONTO, ONT.

A Nationwide Distribution Through Electrical Wholesalers

CONDULETS · TRAFFIC SIGNALS · AIRPORT LIGHTING · FLOODLIGHTS

"Ad-On" MULTI-BREAKER

TYPE MB-4 SERVICE AND LOAD CENTER

ADD CIRCUITS
Easily, Quickly At Low Cost

TYPE MB-4 MULTI-BREAKER:

Includes a basic circuit breaker unit providing 4 single pole, 1 double pole and 2 single pole, or 2 double pole circuits in combinations of 15, 20, 30, 40 or 50 amperes making up 33 standard devices. FLUSH or SURFACE mounting with 70 AMPERE MAINS for small homes and 100 AMPERE MAINS for larger homes.

"AD-ON" UNITS: 1, 2, 3, or 4 single pole circuit breaker units rated 15, 20 or 30 amperes are easily plugged in on basic block.

SQUARE D's THERMAL COILLESS MAGNETIC MULTI-BREAKER

Few homes have enough circuits to serve the many appliances added after the electrical system has been installed.

The new Square D MB-4 Service and Load Center provides room for future circuits—simply add on single pole units as needed to connect that new laundry equipment, attic fan, dishwasher, garbage disposer, food freezer or air-conditioner.

Low cost... elimination of separate devices for extra circuits saves equipment, mounting, nippling and extra wiring.

- Replaces fusible switch—provides both circuit protection and disconnect means.
- Gives 2-way Protection—holds harmless overloads—trips fast on shorts.
- Eliminates fuses—nothing burns out—nothing to replace—no live parts exposed. Anyone can quickly restore service.
- Non-tamperable—unit is factory calibrated, tested and sealed. Underwriters approved.
- Simple mechanism — few moving parts — long mechanical life.

See the new "AD-ON" Multi-breaker at your Square D Electrical Wholesaler

SQUARE D COMPANY

DETROIT · MILWAUKEE · LOS ANGELES

SQUARE D COMPANY CANADA LTD., TORONTO • SQUARE D de MEXICO, S.A., MEXICO CITY, D.F.

Holophane
Trade Mark

PRECISION-ENGINEERED LIGHTING . . .

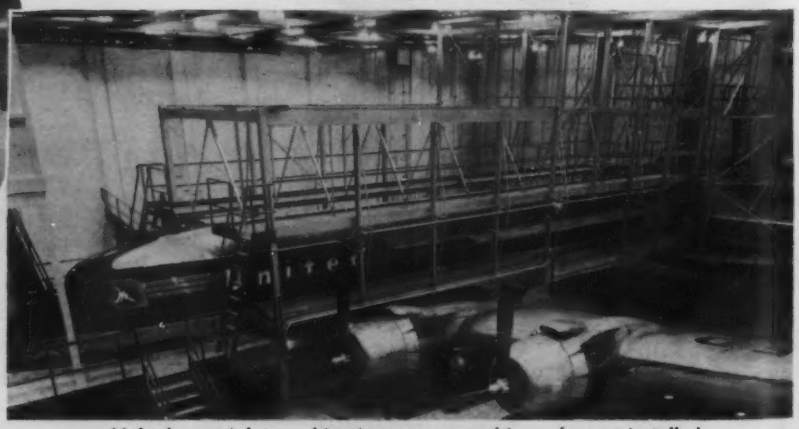
Typical hospital surgery lighting by heat-absorbing Holophane units.

HOSPITAL, store, factory, warehouse—whatever your lighting problem, consult the nearest General Electric Supply Corporation office. With their long experience, constant laboratory testing and research, and complete familiarity with every advance made in the field, G-E Illumination Engineers can completely solve your every lighting problem.

Examples of G-E solutions, the Holophane Luminaires shown in illustrations on this page achieve top levels of lighting efficiency and architectural beauty. Equipped with the famous "Controlens,"* they bend light from useless, glare-causing directions into useful areas.

For competent illumination advice, see your nearest
GENERAL ELECTRIC SUPPLY CORPORATION
office without obligation or expense!

Holophane lighted mezzanine of Samuel Leask & Sons Department Store, Santa Cruz, California.



Holophane triplet combination mercury and incandescent installed at United Airlines maintenance base, San Francisco Airport.

* Ⓡ HOLOPHANE COMPANY, INC.

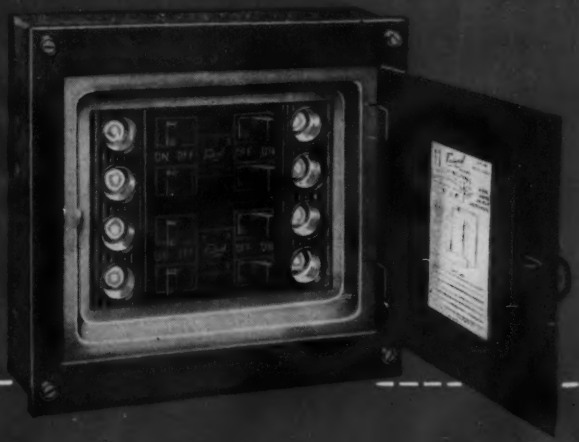
GENERAL ELECTRIC
SUPPLY CORPORATION
SAN FRANCISCO • OAKLAND • SACRAMENTO • FRESNO • LOS ANGELES
SAN DIEGO • PHOENIX • SEATTLE • PORTLAND • TACOMA • SPOKANE

While building costs go up and up ...

The cost of construction continues to soar ... but Federal NOARK Panelboard (Type NTPS) still remains America's most economical, quality panelboard! That's why—on every job that requires perfect control protection of lighting and small power circuits—contractors achieve economy without sacrificing quality ... by installing reliable Federal NOARK Type NTPS!

Triple Improved!

1. Sure contact spring incorporated into switch assembly of stationary parts.
2. Only three current-carrying parts in each circuit ... each part heavier and more rugged than ever.
3. Phenolic panelboard unit ... handsomely designed ... durable.



FEDERAL NOARK PANELBOARDS (Type NTPS) ARE STILL PRICED AT A COMMON-SENSE LEVEL!

Federal NOARK

Executive Offices: 50 Paris Street, Newark 5, N. J.
Plants: Hartford, Conn., Newark, N. J., St. Louis, Mo., Long Island City, N. Y.
SALES OFFICES IN PRINCIPAL CITIES

Federal Electric Products Company, Manufacturers of a Complete Line of Electrical Products, including Motor Controls • Safety Switches • Service Equipment • Circuit Breakers • Panelboards • Switchboards • Bus Duct

Federal NOARK Panelboards

FINAL ASSEMBLY AND TESTING

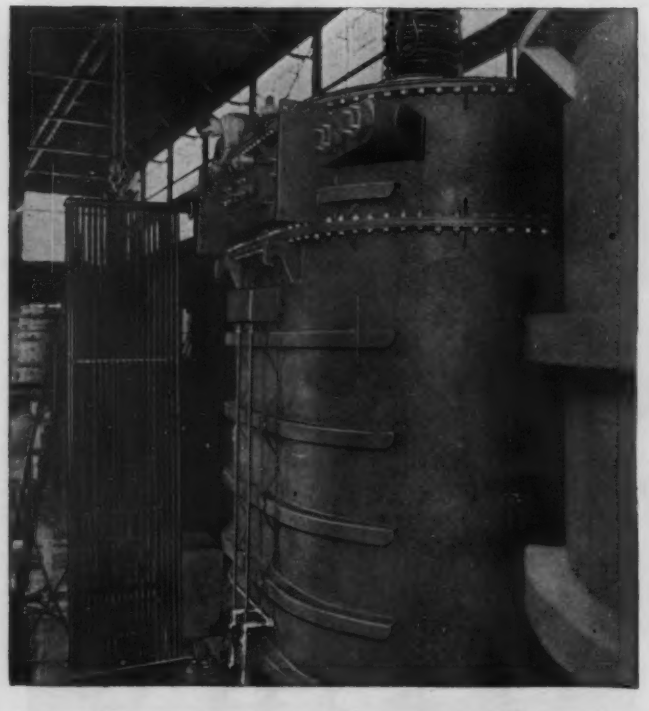
ANOTHER IMPORTANT PHASE IN THE MANUFACTURE OF

Power transformers represent a sizable investment for the purchaser, and he rightly expects them to provide many years of trouble-free service under average operating conditions. Of equal importance to him is the requirement of service continuity from a customer relationship standpoint. With these points in mind, the meticulous care that is exercised all through the earlier stages of production is not relaxed a bit during the final assembling and testing of Moloney Power Transformers. Close supervision and rigid inspection provide added assurance that the performance of the transformer in the field will measure up to the usual high Moloney standard.

MOLONEY ELECTRIC CO.

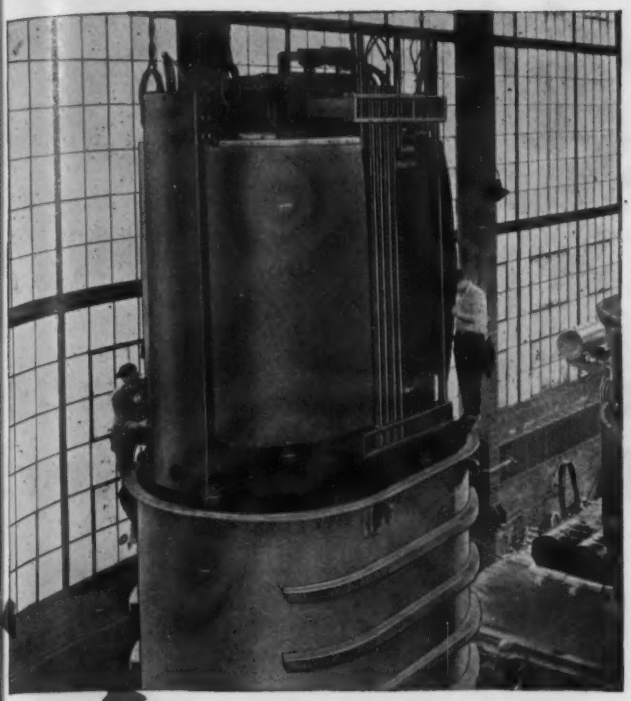
Power and Distribution Transformers Exclusively Since 1896

FACTORIES AT ST. LOUIS 20, MISSOURI AND TORONTO, ONTARIO, CANADA

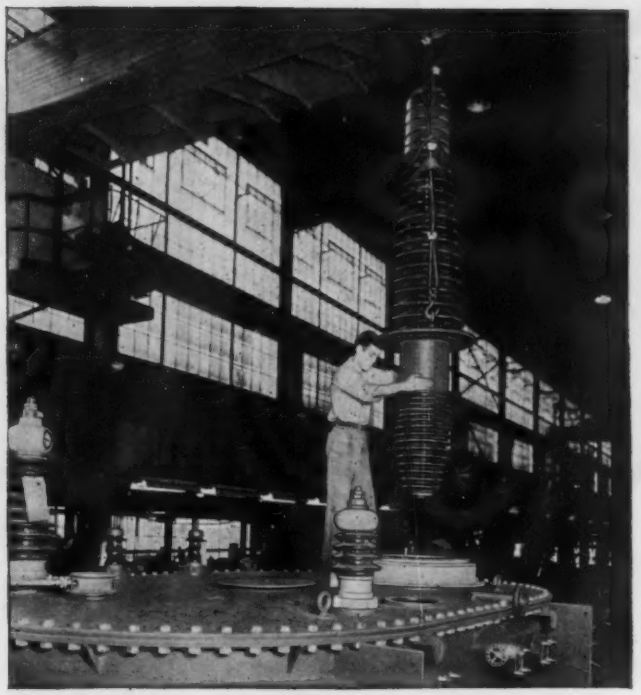


On small power transformers, the extra radiating surface necessary for dissipating the heat generated by the core and copper loss, is obtained by means of tubes or radiators welded directly to the tank wall. On larger power transformers extra radiation is provided by means of detachable radiators. Photo shows detachable type radiator being installed.

After the transformer has been completely assembled, it is thoroughly tested for possible leaks. In addition, the larger, high voltage transformer tanks are tested for ability to withstand *full vacuum* such as might be encountered in vacuum drying a transformer in its own tank in the field. Following this, standard electrical tests are made to assure performance in accordance with the guarantees.

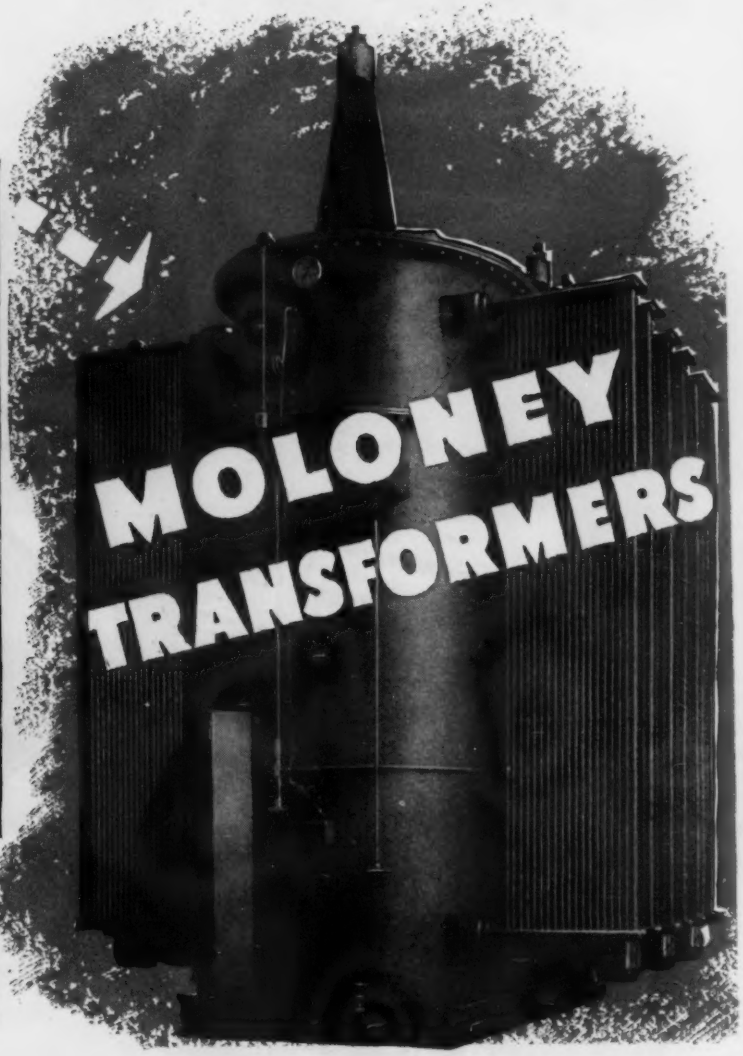


Following drying in a vacuum tank, the core-and-coil assembly is placed in its own tank, under oil. Channel guides provided on the inside of the tank to facilitate this operation, make it simple for the purchaser to remove the core-and-coil assembly for inspection, if desired.



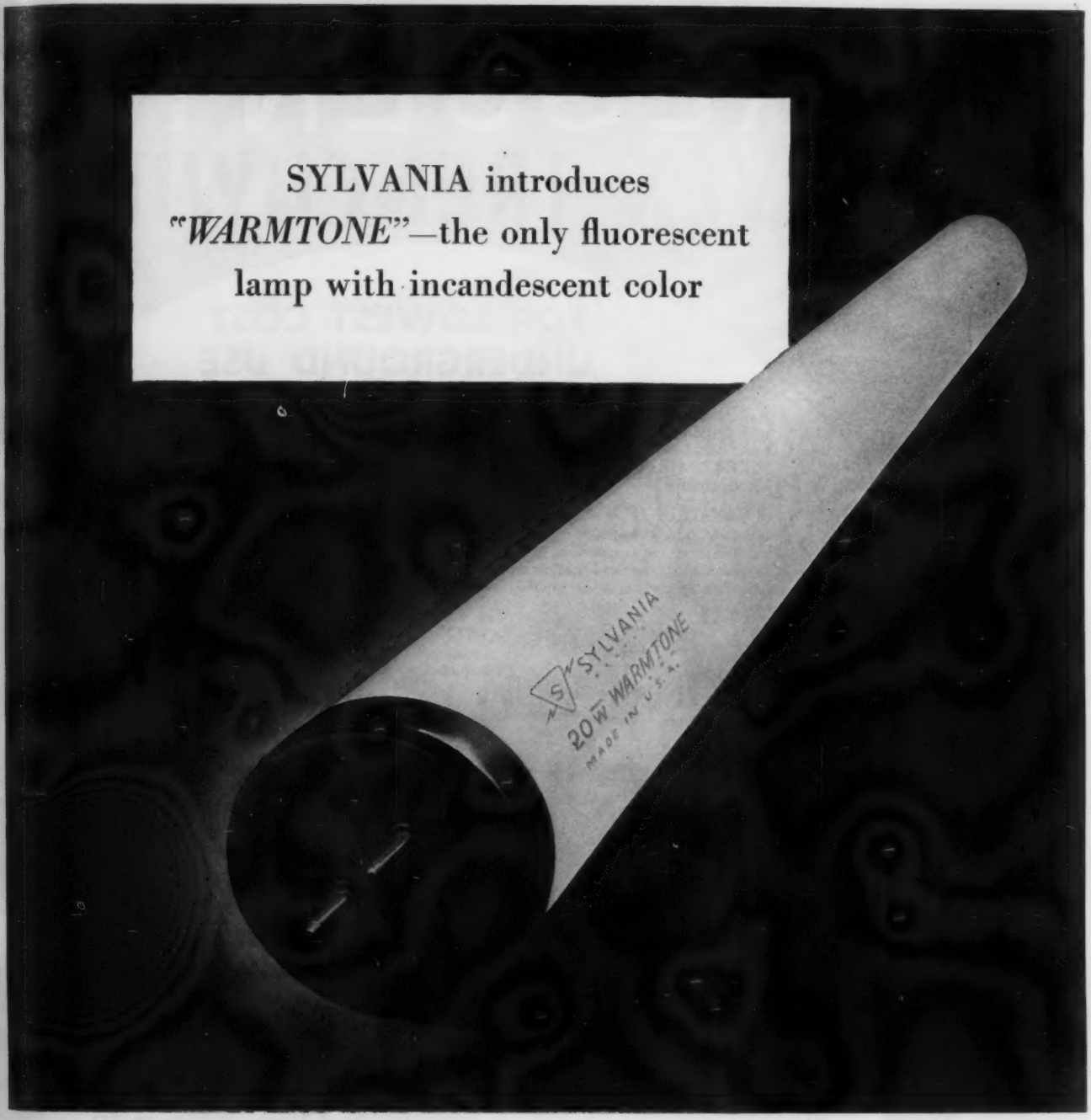
After the core-and-coil assembly has been tanked and anchored securely in place, the tank cover is bolted or welded into position. The bushings are then installed. Photo shows a 115 Kv oil-filled bushing being lowered into position.

Frequently, purchasers specify that their transformers be impulse tested. This test is performed in the Moloney Surge Laboratory located at one end of the Power Transformer Assembly Department. Impulse tests, especially steep front-of-wave tests, simulate lightning conditions and are the most severe that can be imposed upon a transformer. The results of these tests are recorded on film by means of a cathode ray oscillograph.



"2 OVENS"
Still... THE BIGGEST FEATURE
any Electric Range Dealer Can offer!
The Monarch Built-In Surface Oven
Saves stooping — Saves electricity
Easy accessibility for basting
Two oven temperatures always available
Makes an excellent "steam table" server
Is perfect for complete dinners, fowl, wild game, baked beans, sauerkraut and spare-ribs, New England dinners, casserole dishes, biscuits, baked ham . . .
Provides 2-oven flexibility
(a) small oven for small meals
(b) large oven for large meals
(c) two ovens for entertaining
Backed by national radio and magazine advertising
It's a 100% exclusive Monarch feature . . . .
a 100% exclusive range.
MARCH MALLEABLE RANGE CO.
2978 LAKE STREET
SINCE 1896
Monarch
ELECTRIC
2-OVEN ROASTER RANGE

SYLVANIA introduces "*WARMTONE*"—the only fluorescent lamp with incandescent color



SYLVANIA engineering and research chalk up another "first" in the lighting industry with the introduction of WARMTONE —the fluorescent lamp with incandescent color.

Promising a more widespread acceptance for fluorescent, WARMTONE opens up a vast, untouched market for improved lighting in the commercial and residential fields.

The same skill and leadership that developed WARMTONE are responsible for Sylvania's equally outstanding achievements in the fields of Radio, Television, FM and Electronics.

ALL PRODUCTS MADE BY SYLVANIA ELECTRIC CONSUME ENERGY — MORE THAN 10,400,000,000 KWH PER YEAR

SYLVANIA ELECTRIC

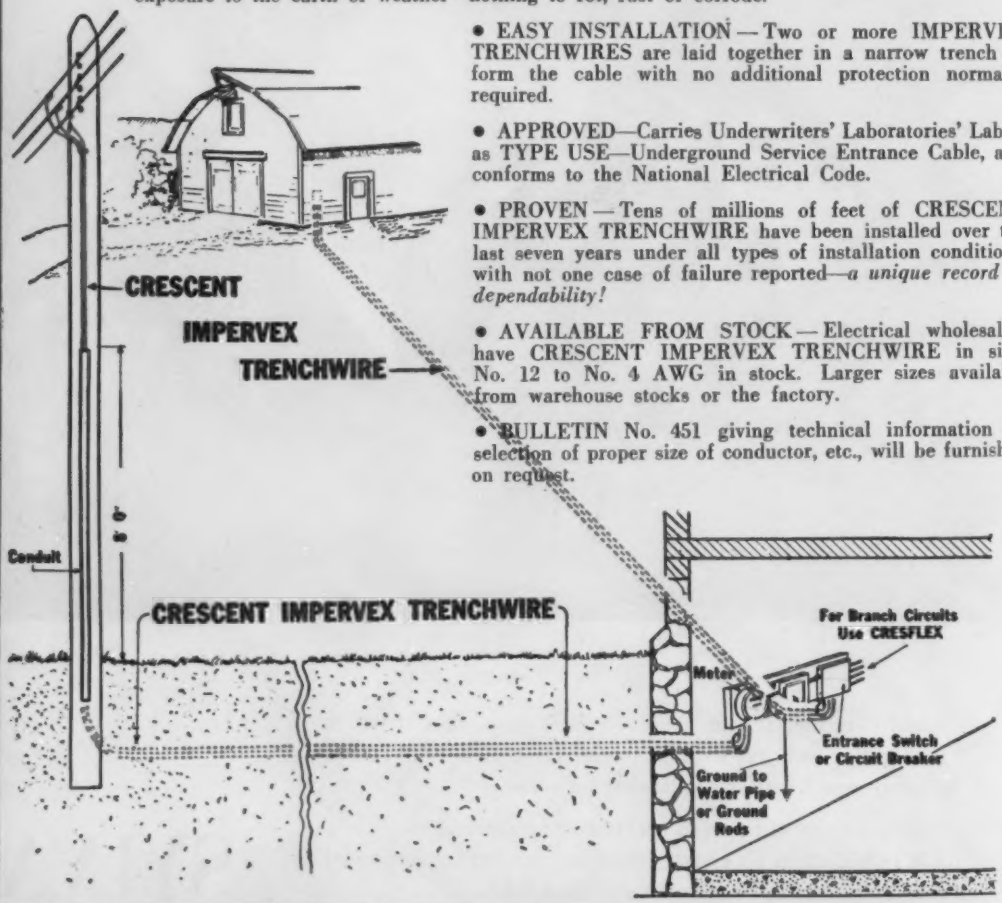
WEST COAST DIVISION OFFICES: LOS ANGELES, SAN FRANCISCO, SEATTLE

CRESCENT
IMPERVEX TRENCHWIRE

FOR LOWEST COST UNDERGROUND USE

• CRESCENT IMPERVEX TRENCHWIRE provides the LOWEST COST, PERMANENT underground installation for services from power line to meter, for connecting several buildings from the same service, as on FARMS, ESTATES and INSTITUTIONS and for STREET, AIRPORT, BALL PARK, DRIVE-IN THEATRES and other outdoor lighting and power circuits.

• CONSTRUCTION—The single copper conductor is insulated with IMPERVEX special moisture and heat-resisting rubber insulation. A tough NEOPRENE armor sheath is vulcanized over the insulation, protecting it from injury during and after installation. The cable is flame-retarding and practically UNAFFECTED by water, oil, acid, alkali, sunlight and exposure to the earth or weather—nothing to rot, rust or corrode.



• EASY INSTALLATION — Two or more IMPERVEX TRENCHWIRES are laid together in a narrow trench to form the cable with no additional protection normally required.

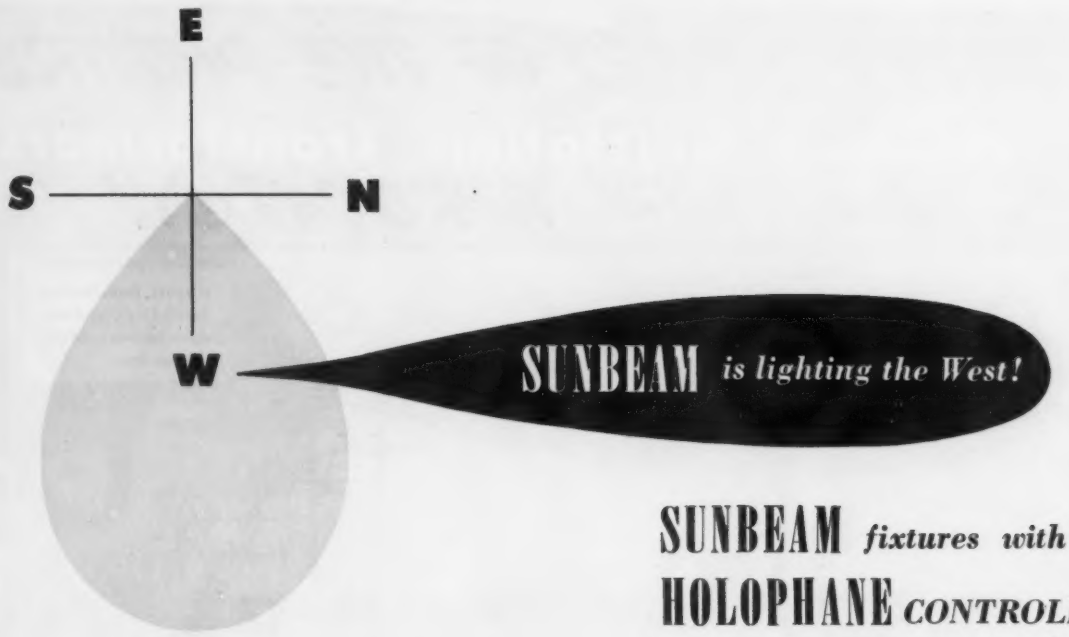
• APPROVED—Carries Underwriters' Laboratories' Labels as TYPE USE—Underground Service Entrance Cable, and conforms to the National Electrical Code.

• PROVEN — Tens of millions of feet of CRESCENT IMPERVEX TRENCHWIRE have been installed over the last seven years under all types of installation conditions, with not one case of failure reported—*a unique record of dependability!*

• AVAILABLE FROM STOCK — Electrical wholesalers have CRESCENT IMPERVEX TRENCHWIRE in sizes No. 12 to No. 4 AWG in stock. Larger sizes available from warehouse stocks or the factory.

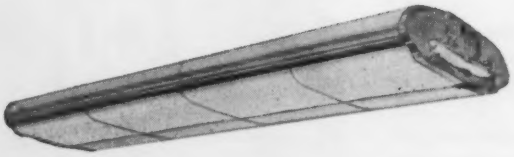
• BULLETIN No. 451 giving technical information on selection of proper size of conductor, etc., will be furnished on request.

CRESCENT
WIRE & CABLE
CRESCENT INSULATED WIRE & CABLE CO.
TRENTON, N. J.

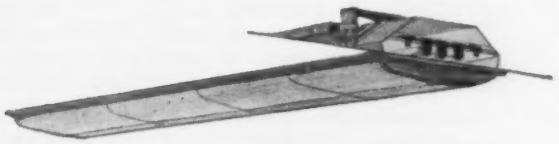


SUNBEAM *fixtures with* HOLOPHANE *CONTROLENS**

CONTROLENS are scientifically designed and manufactured for the most effective all-over, no glare illumination. Sunbeam fixtures with CONTROLENS are only part of a complete line of fluorescent fixtures.

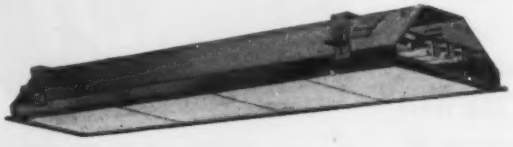


H—8082 with Holophane #9100 CONTROLENS and #9099 top-sides panels. Surface fixture with continuous piano hinge.

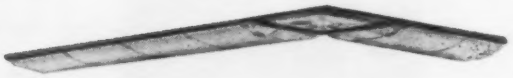


H—9042 with Holophane #9100 CONTROLENS. Recessed fixture made with continuous piano hinge for lenses—or unhinged.

H—7043 with Holophane #11F12 CONTROLENS. Recessed fixtures with flat lens made with continuous piano hinge.



923, a Sunbeam spot light for accent designed to fit Sunbeam fixtures.



Sold only through leading electrical distributors

777 E. 14th Place, Los Angeles, Calif

SUNBEAM LIGHTING COMPANY

*(R) Holophane Co., Inc.

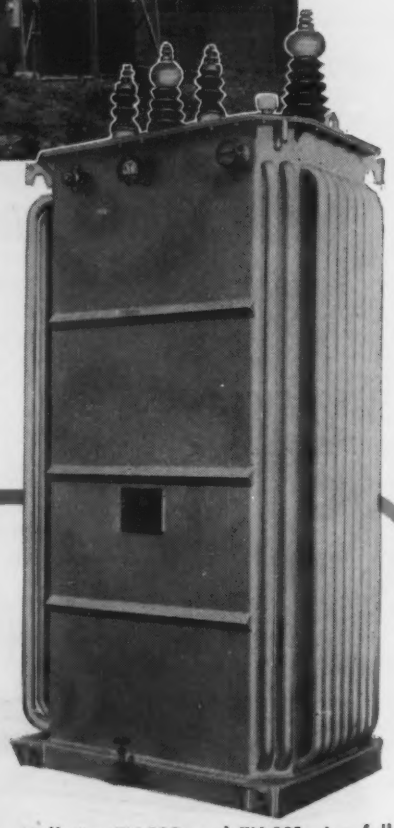
THEY'RE PART OF THE PICTURE...

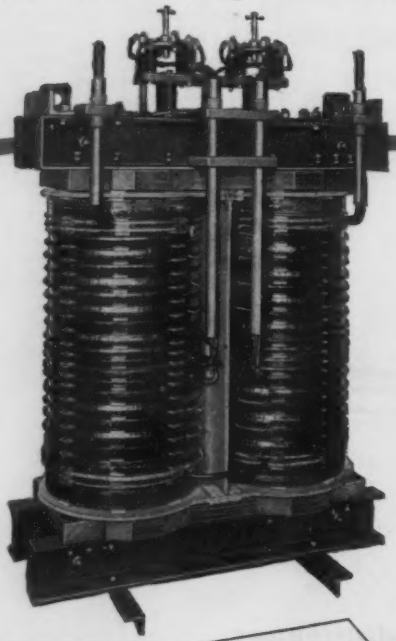
Wagner Substation Transformers for RURAL APPLICATION

Wagner transformers installed in a typical substation feeding rural distribution lines.

WAGNER builds a complete line of oil-filled, self-cooled transformers for substation operation on distribution systems. Hundreds of these transformers are supplying many of the rural-line systems in operation throughout the country. They are available in all standard kva and voltage ratings with standard accessories.

Wagner transformers are nationally known for their high standard of quality and performance based on a background of a half-century of designing and building distribution and power transformers. Trained field engineers in our 29 branch offices, located in principal cities, are ready to help solve your Rural-Line Transformer problems.





Pictured at right is a 500 kva 46000 to 7200 volt, type HEL transformer. These units are available in sizes 150 to 500 kva in standard voltage combinations up to 69 kv.

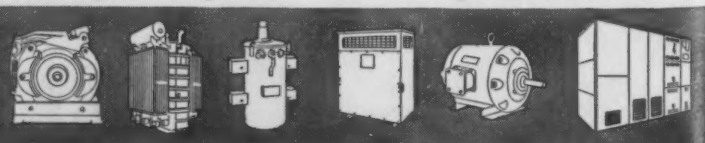
The element, shown at left, is a typical core-type element, like those generally used in transformers of this classification. Note its simple design and sturdy construction . . . built for years of rugged service.

Bulletins TU-180 and TU-181 give full information on Wagner Substation Transformers. Write for your copies.

Wagner Electric Corporation
6381 PLYMOUTH AVE., ST. LOUIS 14, MO., U.S.A.

Wagner Electric Corporation EST. WE 1891

Consult Wagner Engineers on All Transformer Problems



BRIDGE BRAKES • POWER AND DISTRIBUTION TRANSFORMERS • MOTORS • UNIT SUBSTATIONS

ELECTRICAL AND AUTOMOTIVE PRODUCTS

T48-10

...and for fluorescent lighting I *insist* on

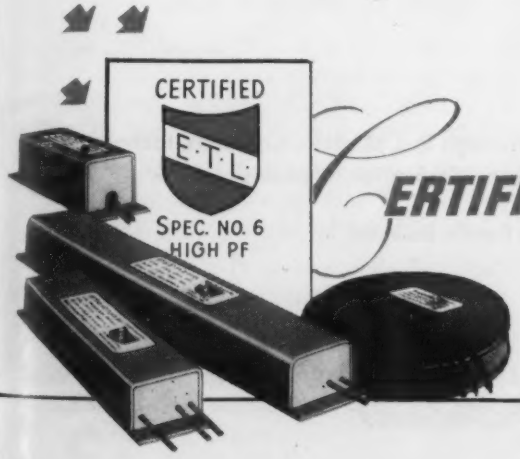
Certified Ballasts!

You're wise, too, when you insist on Certified Ballasts.

That's one way to assure—

- **Full rated lamp life**
- **Quiet operation**
- **Long, dependable performance**
- **Full rated light output**

Certified Ballasts are better because they are built to rigid specifications that assure high performance—then are tested, checked and "certified" by impartial Electrical Testing Laboratories, Inc.



CERTIFIED BALLAST MANUFACTURERS

Makers of Certified Ballasts for Fluorescent Lighting

2116 KEITH BLDG., CLEVELAND 15, OHIO

UNION PACIFIC

The Governor of Colorado *invites You*

THE STATE OF COLORADO
EXECUTIVE CHAMBERS
DENVER

WILLIAM LEE KNOUS
GOVERNOR

To American Industry:

Look long at Colorado.

A vigorous, young state, awake to its opportunities yet aware of its needs, will challenge your attention and stimulate your imagination.

Natural resources we have in abundance with the water and power for their development. Our labor force is highly adaptable, our markets are rapidly expanding.

Our health-giving climate, our scenic setting make Colorado a soul-satisfying home for you and your families.

And most important — we know where we're going! Our leaders in business, industry, agriculture and education, through their Resources Development Council, are charting a course toward a sound, stable future for our people.

Look long at Colorado — it offers you much!

Lee Knous
Governor

Lee Knous

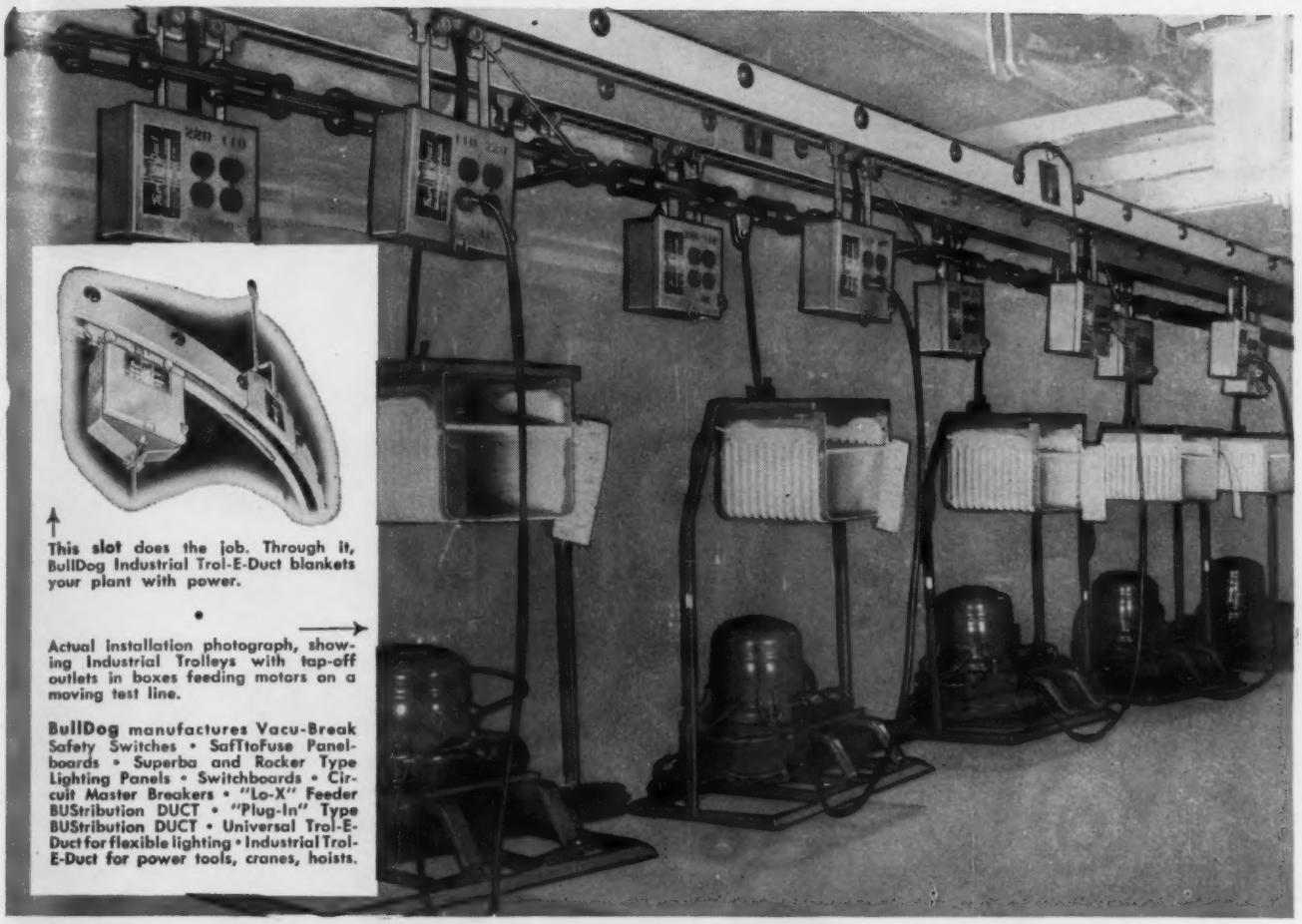
* One of a series of advertisements based on industrial opportunities in the states served by Union Pacific Railroad.

Unite with Union Pacific in selecting sites and seeking new markets in California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, Oregon, Utah, Washington, Wyoming.

***Address Industrial Department, Union Pacific Railroad
Omaha 2, Nebraska**

UNION PACIFIC RAILROAD

Road of the Daily Streamliners



This **slot** does the job. Through it, BullDog Industrial Trol-E-Duct blankets your plant with power.

Actual installation photograph, showing Industrial Trolleys with tap-off outlets in boxes feeding motors on a moving test line.

BullDog manufactures Vacu-Break Safety Switches • SafTtoFuse Panelboards • Superba and Rocker Type Lighting Panels • Switchboards • Circuit Master Breakers • "Lo-X" Feeder BUStribution DUCT • "Plug-In" Type BUStribution DUCT • Universal Trol-E-Duct for flexible lighting • Industrial Trol-E-Duct for power tools, cranes, hoists.

Power that moves right along with the job

WHERE BullDog Industrial Trol-E-Duct is installed, power travels right along with cranes, hoists, assembly or test lines and portable tools like a well-trained pup.

Ball-bearing trolleys travel in a continuous slotted duct, collecting current anywhere along the line. *Wherever* you want power . . . there it is!

This BullDog system is convenient beyond all possibilities of old-style wiring systems. Neater, safer, too. Lengthy, entangling extension cords are eliminated. Conductors are enclosed inside the sturdy steel duct casing . . . no danger of accidental contact.

Take changes in stride

BullDog Industrial Trol-E-Duct permits the addition of new outlets to meet increased requirements without additional wiring. All you do is insert another trolley in the duct to supply each new "load."

If your electrical distribution system must be moved, you can take down Industrial Trol-E-Duct, move it and reinstall with *no loss of parts.*

It's a mechanically strong and electrically superior system. Durable steel duct casing encloses and supports rigid bus bars to provide maximum strength. Movable trolley outlets and insulating materials that do not deteriorate ensure electrical superiority.

There's a BullDog Field Engineer near you, ready with all the facts on this remarkable power system. Call him anytime.

BullDog's Field Engineers welcome the chance to sit in on planning stages of a building project. Their knowledge of electrical distribution layout can mean savings in installation and maintenance costs, as well as highest efficiency and reliability in actual operation. Why not take advantage of this pre-building service?

BULLDOG ELECTRIC PRODUCTS COMPANY
DETROIT 32, MICHIGAN—FIELD OFFICES IN ALL PRINCIPAL CITIES
IN CANADA: BULLDOG ELECTRIC PRODUCTS OF CANADA, LTD., TORONTO

BULLDOG

HEADQUARTERS FOR ELECTRICAL DISTRIBUTION

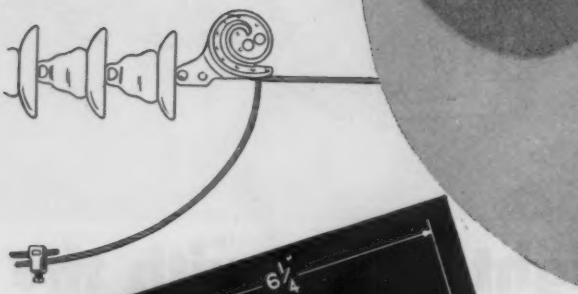
CONSULT THE FOLLOWING PACIFIC COAST REPRESENTATIVES:

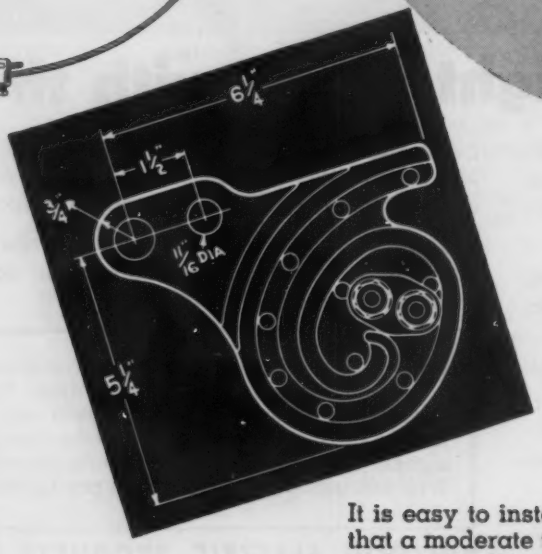
Coast Electric & Manufacturing Co.
1720 N. E. Sixth Avenue Tel. Garfield 2844
Portland 12, Oregon

Safety Switchboard Company
1445 Stevenson St. Tel. Hemlock 1-2470
San Francisco 3, Calif.

Mullenbach Electrical Manufacturing Co.
2300 East 27th Street Tel. Jefferson 2224
Los Angeles 11, Calif.

SNUB DEADEND *for* A. C. S. R.



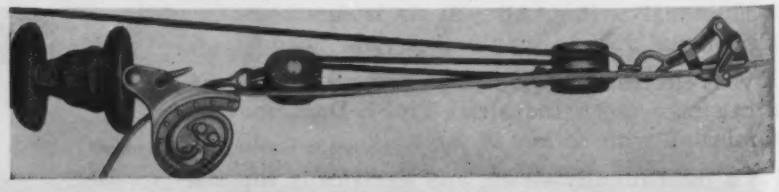


It has been approved for use on A. C. S. R. without armor tape

THE RELIABLE No. 420 Snub Deadend is made of high strength, non-corrosive aluminum alloy, is low in cost and accommodates No. 2 or No. 4 A.C.S.R.

The spiral form of this deadend for A.C.S.R. carries the snub principle to full advantage. This clamp develops approximately the full strength of the conductor and distributes the strain equally on all strands.

It is easy to install and has enough margin of holding power so that a moderate tightening of the clamp develops the full strength of the wire. Weighing about three-quarters of a pound, this clamp minimizes vibration fatigue strains, prolonging the life of the conductor.



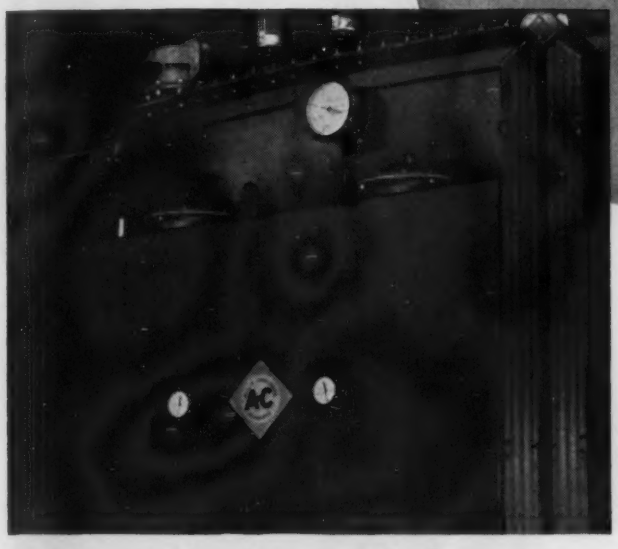
Reliable

ELECTRIC COMPANY

3145 CARROLL AVENUE CHICAGO 12

OVER 40 YEARS Service TO THE UTILITIES

No More Pressure than in a Toy Balloon!



The same 1 pound pressure in a toy balloon . . . is all that's in *Oil-Sealed* Inert Gas System for Allis-Chalmers Transformers!

NO OTHER TRANSFORMER inert gas system operates at such low pressure. And to you that can mean — safety, low pressure on gaskets — low gasket maintenance!

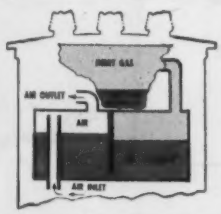
In addition, the system is tops for simplicity! It has no moving parts; no sensitive gauges or reduction valves; it doesn't require periodic replenishment of nitrogen; no bottles to buy!

Originated by A-C in 1923, this system is now standard for over 5,000,000 kva of U. S. Power! For more information call your nearby A-C sales representative, or write ALLIS-CHALMERS, MILWAUKEE 1, WISCONSIN. *Oil-Sealed* is an Allis-Chalmers trademark.

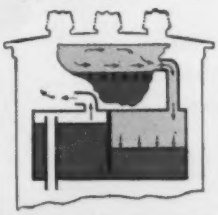
A 2497

SIMPLE AS A-B-C

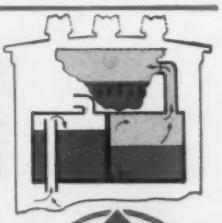
A PRINCIPLE — Transformer cooling oil is isolated from the atmosphere by inert gas and oil seal. This prevents sludge formation and fire hazard due to oxygen. By excluding moisture the system maintains high dielectric quality of oil.



B AS TRANSFORMER HEATS, the cooling oil expands, displacing inert gas from main tank to auxiliary tank. The transfer of gas to the auxiliary tank is cushioned by the change of oil levels as shown, keeping the main tank pressure low.

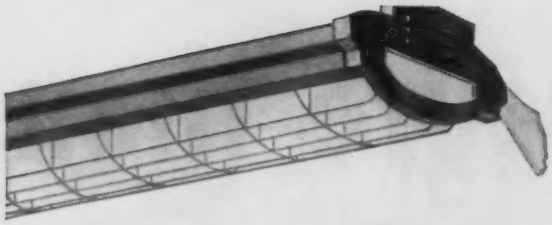


C AS TRANSFORMER COOLS, the reverse takes place. In this simple manner inert gas protection is provided automatically . . . transformer oil adjusts itself to changing temperatures without being exposed to the atmosphere.



ALLIS-CHALMERS

Originators of the "Oil-Sealed" Inert Gas System!



Certified Starters

assure full lamp life

● Maximum fluorescent lamp life . . . with resultant lowered maintenance costs . . . are possible only when starters operate efficiently.

CERTIFIED STARTERS give the best possible performance because they are:

Made to rigid specifications

Tested, checked and certified by impartial Electrical Testing Laboratories, Inc.

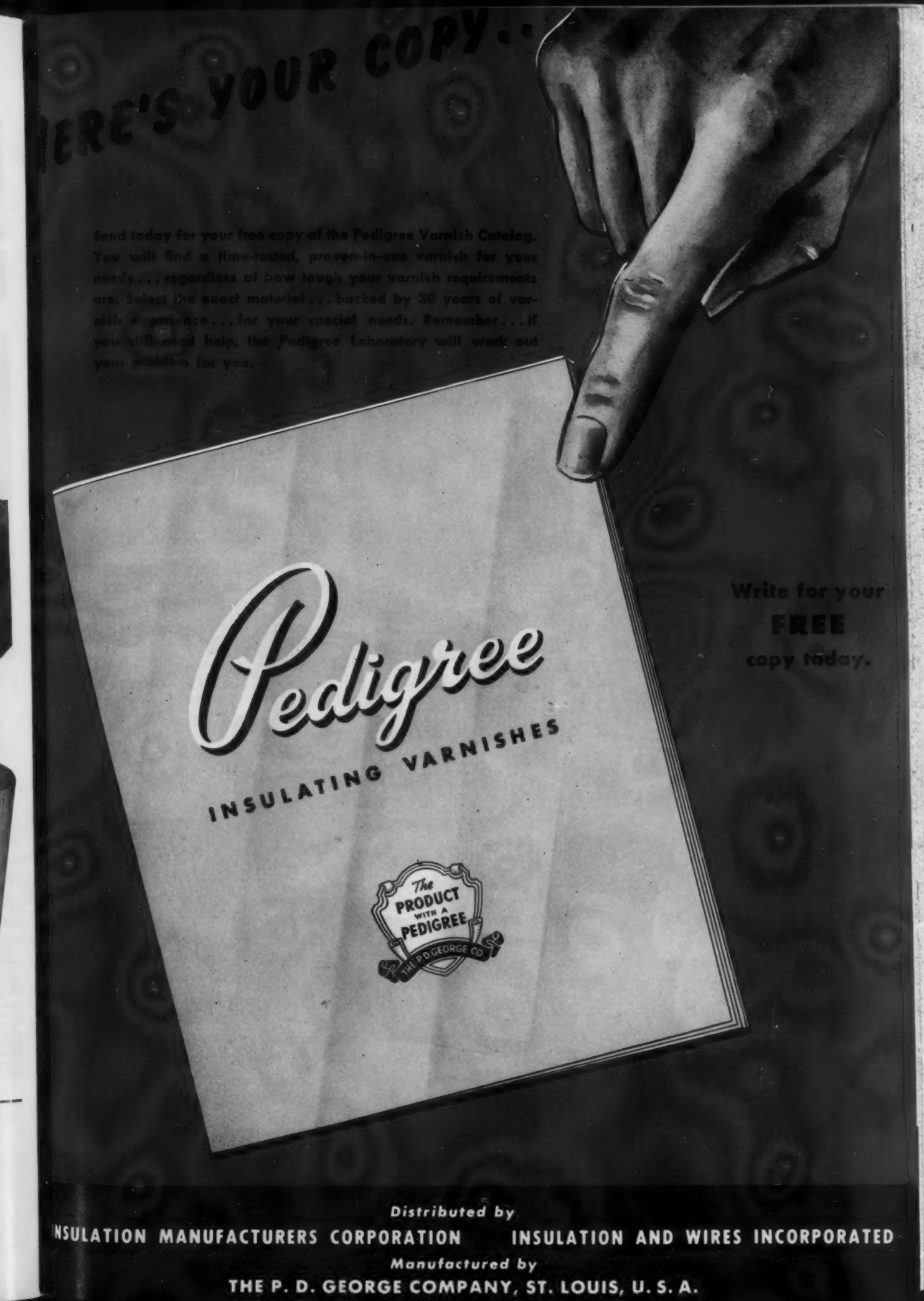
You'll quickly notice the economy...appreciate the reduced lamp and starter replacements . . . when you insist on Certified Starters in your fluorescent installations.

● To be sure you get Certified Starters, look for the Certified shield on the case and on each starter.

Address inquiries to any of the following manufacturers of

Certified Starters

The Arrow-Hart and Hegeman Co., Hartford, Connecticut
The Bryant Electric Co., Bridgeport, Connecticut
Chatham Electronics Corporation, Newark, N. J.
Dura Electric Lamp Co., Newark, N. J.
General Electric Co., Bridgeport, Connecticut
Harvey Hubbell, Inc., Bridgeport, Connecticut
Instant Glow Starter Corporation, New York, N. Y.
Kuthe Laboratories, Inc., Newark, N. J.
The Lloyd Products Co., Providence, R. I.
Pass & Seymour Co., Syracuse, N. Y.
Sheldon Electric Co., Irvington, N. J.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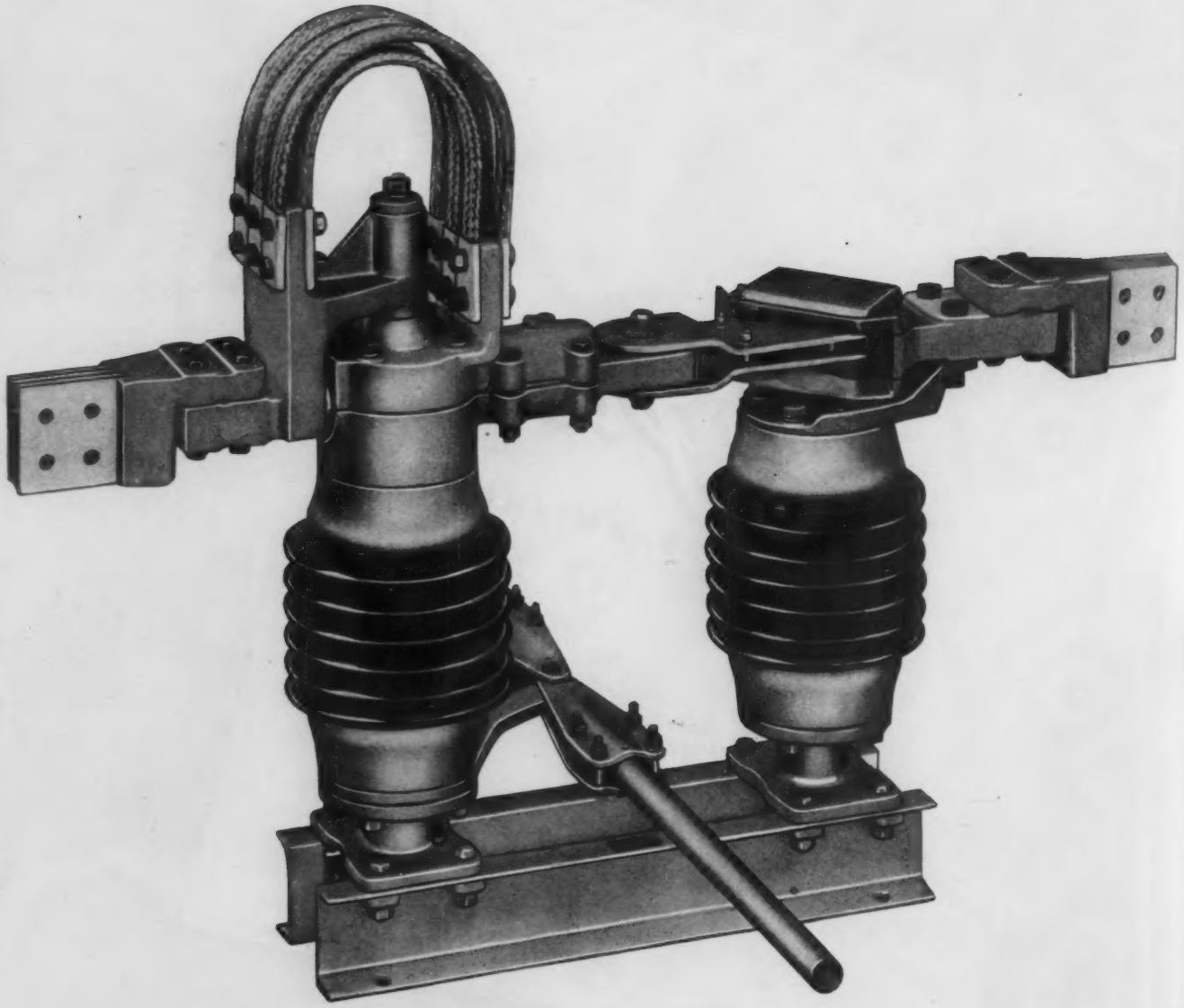
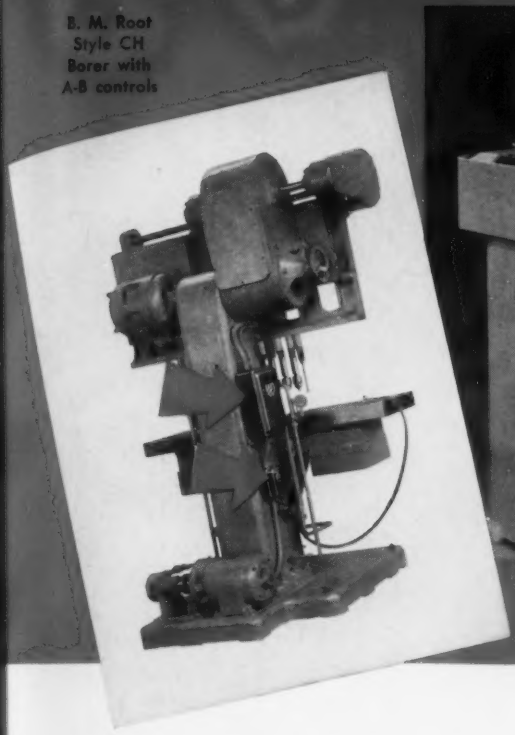


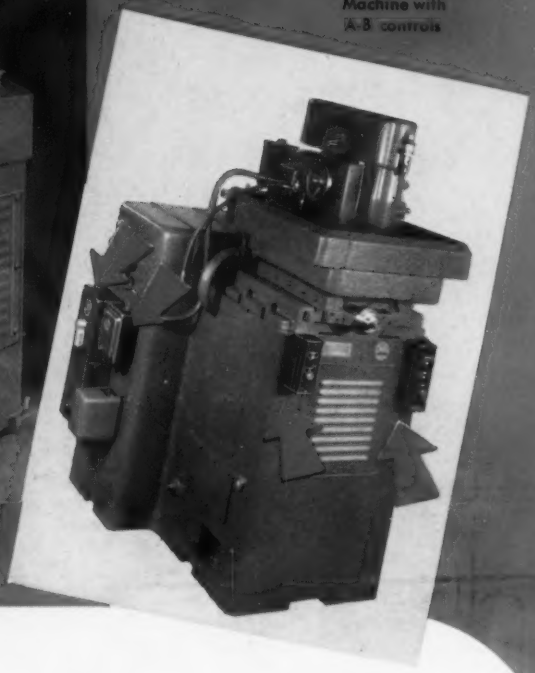
OUTDOOR DISCONNECTING SWITCH
23000 Volts—2000 Amperes
Type LU-Three Pole-Single Throw
Single Side Break—Group Operated
(One Pole Shown) Bulletin 42 A

ALLEN-BRADLEY CONTROLS.. *Simple..Trouble Free*



B. M. Root Style CH Borer with A-B controls

Micromatic Honing Machine with two A-B Automatic Solenoid Starters



LeMaire Profile Grinding Machine with A-B controls

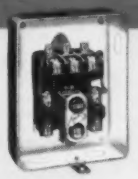
When You Install Motor Controls . . .

follow the leading machinery builders and standardize on Allen-Bradley

At the big International Machine Tool Show in Chicago, Allen-Bradley starters were original equipment on more machines than were the next three makes of starters, combined. In fact, Allen-Bradley starters were standard on nearly half of all machines at that record-breaking show. When one make of motor control . . . like Allen-Bradley . . . dominates the machine tool industry, the reasons are—dependability, accuracy of operation, and long life.

You, too, can enjoy the unequalled advantages of simple, trouble-free motor controls in your plant. Just specify Allen-Bradley.

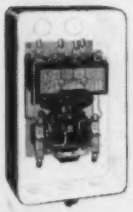
Allen-Bradley Co., 1316 S. Second Street, Milwaukee 4, Wis.



BULLETIN 609 MANUAL STARTERS

Quick-make, quick-break switch with silver alloy, double breck contacts.

Two thermal overload breakers



BULLETIN 709 MAGNETIC STARTERS

Simple solenoid switch with silver alloy, double break contacts.

Two thermal overload relays

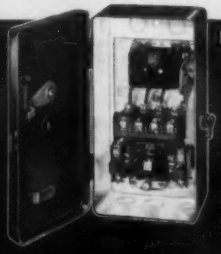
Variety of enclosures

See next page ⇨

ALLEN-BRADLEY

SOLENOID MOTOR CONTROL

QUALITY



BULLETIN 712 COMBINATION STARTERS

Two units—disconnect switch and motor starter in one cabinet.

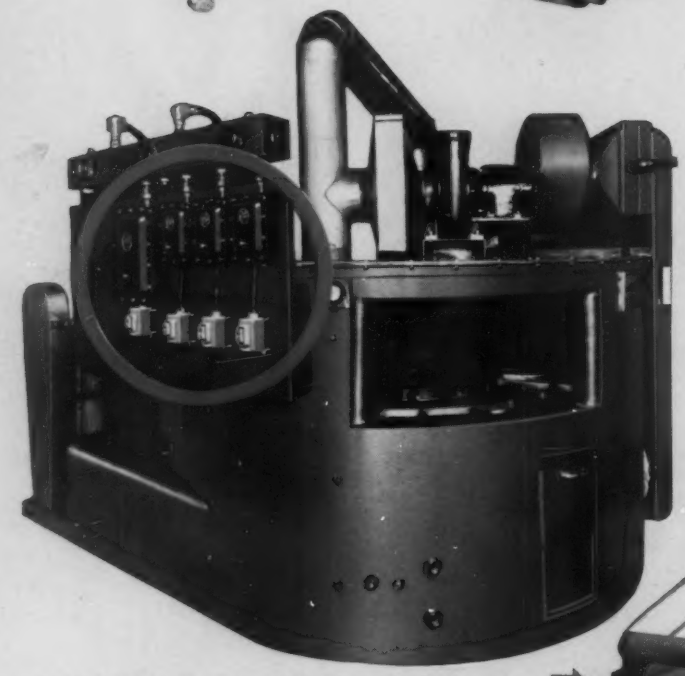
Both have silver alloy, double break contacts

Overload protection

How To Pick MOTOR STARTERS for Hazardous or Wet Locations

MANUAL STARTERS—Bulletin 609

This New Jersey Machine Corporation labeling machine seals cartridge boxes. Allen-Bradley manual starters were specified with NEMA Type 7, cast-iron enclosures, because they are sealed for safe operation in explosive atmospheres.



AUTOMATIC STARTERS—Bulletin 709

This Ransohoff cleaning machine uses flammable solvents. The Allen-Bradley automatic starters and push-button stations, therefore, have NEMA Type 7, cast-iron enclosures with sealed covers. There is no danger of explosions when these enclosures are used.

COMBINATION STARTERS—Bulletin 712

Here is a Link-Belt Liquid Vibrating Screen, installed outdoors. The Allen-Bradley combination starter combines disconnect unit and motor starter in cast-iron, NEMA Type 4, watertight cabinet . . . the right enclosure for maximum reliability.

A-B Quality

ALLEN-BRADLEY

SOLENOID MOTOR CONTROL

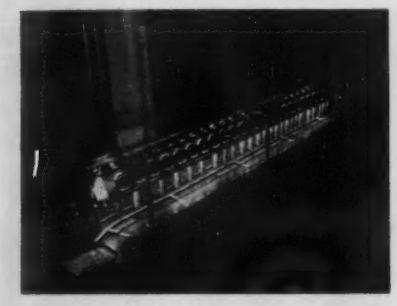
QUALITY

PRODUCT NEWS

Bottle Sealer (700)

Wuelker Infrared "Celo-O" sealer designed and manufactured by Wuelker Infra Red & Lighting Co. consists of an adjustable rack, 12 ft. long, with four adjustable channels holding 46 R-40, 375-watt infrared lamps, 23 to a side, staggered, on 6-in. centers.

The two rows of lamps are focused directly upon the necks of the continuously traveling bottles beneath, on which the Cel-O seals have been slipped loosely before entering the sealer. As the bottles go into the heated area,



the seals automatically become fastened to them. The bottles are carried through the 12 ft. of infrared heat in 29 seconds and are ready for packing and shipping, as compared with the three to four hours required with air drying.

The channels have pure copper baffles and guides, designed to hold the bottles without motion as they pass along through the sealer. Channels may be raised or lowered to accommodate different heights of bottles.

Aluminized Steel (701)

Sylvania Electric Products has announced a new type of aluminized steel providing a surface with heat-radiating properties 85% of the perfect black body and evolving minimum gas during manufacture and operation of vacuum tubes. This material is available in .005-in. strips in varying widths or as anodes and other fabricated parts for vacuum tube use.

Advantages of the material in vacuum tube manufacture, according to the manufacturer, are elimination of need for carbonizing nickel-plated steel parts, better welding properties, lower cost, elimination of possible transfer of carbon to cathode.

F Industrial Fixture (702)

A 2-light fluorescent industrial fixture, with heavy-gage aluminum wireway channel and reflector, has been announced by the Kahn Mfg. Co. as Model 602-E. It uses two 40-watt lamps and a 2-lamp ballast fully enclosed in channel; is finished in neutral grey-green, Dura-Baked enamel.

F Night Light (703)

A 1-watt fluorescent night light is available from Westinghouse. The walnut-sized lamp is for use on 110-125-volt a-c; has two-prong base for plugging into baseboard or wall outlets. Operating cost is said to be 2½c a month for around the clock use. Average life is one year.

IMMEDIATE SERVICE
ON ALL
YOUR MOTOR REPAIR MATERIALS AND TOOLS

INSULATION AND WIRES
INCORPORATED

Letting IWI handle all your needs is like having a completely stocked warehouse right next door. IWI means no time wasted in waiting — no separate orders to many suppliers — no extra shipping or handling costs. Get what you want *fast,* with ***one order*** and ***one delivery.***

All IWI repair shop items are nationally known and service proved. Every one is guaranteed to be of highest quality. Specially trained IWI field service representatives are ready to help you. Depend on them without obligation.

Call on IWI for Service!
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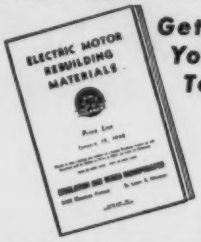

IN STOCK—READY TO SHIP

Magnet Wire	Saturated Sleeving
Motor Lead Wire	Insulating Varnish
Bearings	Built-up Mica Products
Insulating Paper	Asbestos Insulation
Fibre	Woven Glass Insulation
Bakelite	Pressure Sensitive Tape
Fibre Wedges	Cotton Sleeving
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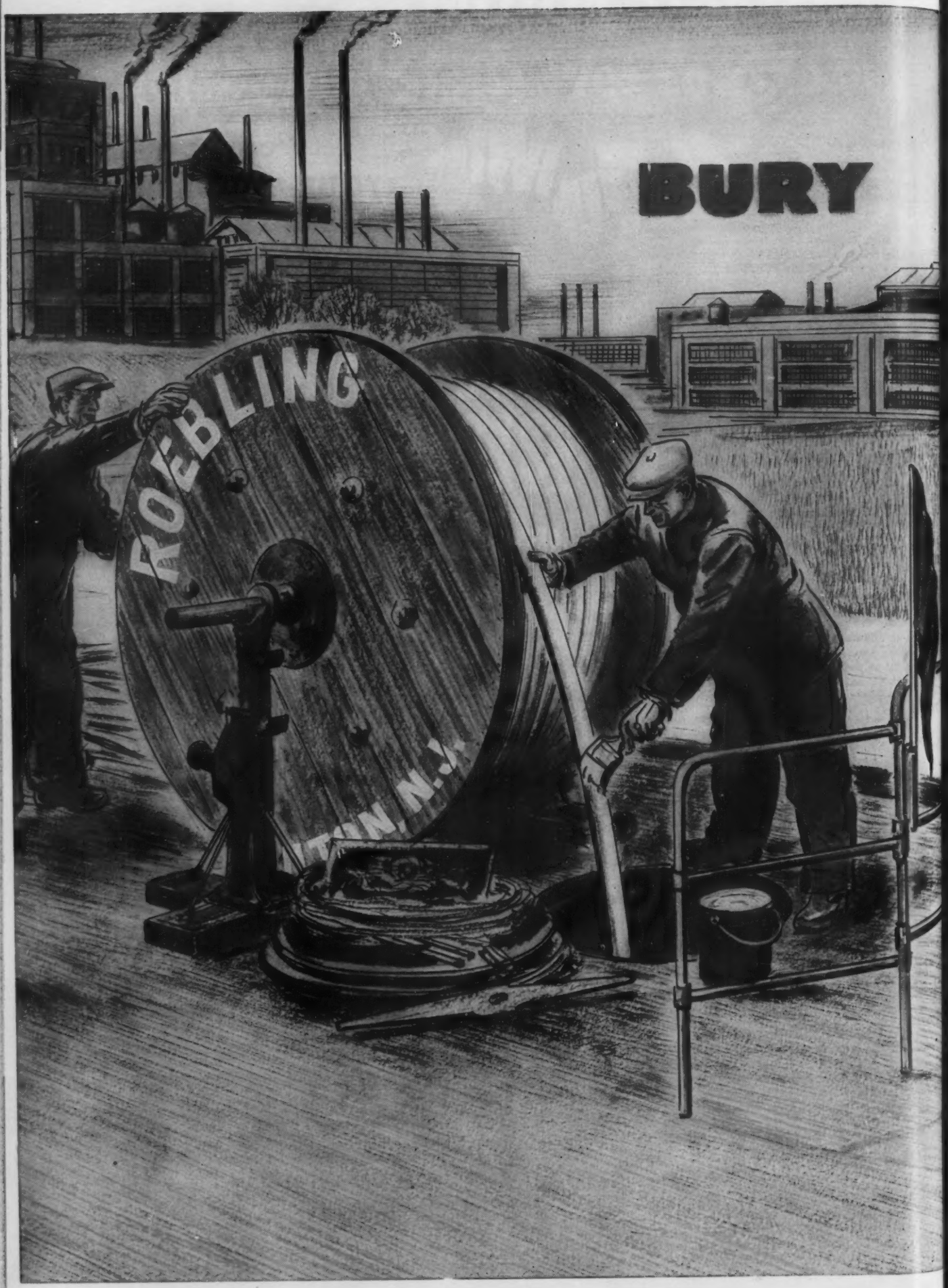

BURY
ROEBLING

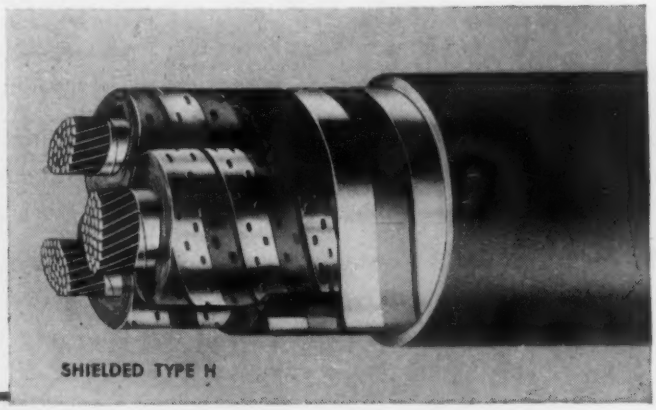
YOUR TROUBLES

GET RID OF OVERHEAD LINES and you get rid of exposure to storms and weather, costly maintenance and unsightliness. With Roebling Paper Insulated Lead Encased Cables your transmission, distribution and service circuits go underground . . . give you dependable, uninterrupted service at lowest obtainable cost.

Roebling Shielded Type H is being widely adopted for 3-phase grounded neutral circuits from 13 to 33 kv. This solid type cable is available both single and multiple conductor construction, in regular and Compack strand (round or sector). Conductors, shielded with metallized paper, are then individually insulated, protected with a perforated copper shielding tape, and the whole assembly served with a bronze binder tape. The finest materials plus Roebling engineering and production techniques give Shielded Type H characteristics of high importance in the utility field.

For a standard power cable or one manufactured for individual requirements, specify Roebling . . . your assurance of dependability and long-term low cost. A Roebling Field Man will be glad to help you select the *right* cable for specific service. Call him at our nearest branch office.

JOHN A. ROEBLING'S SONS COMPANY
OF CALIFORNIA
San Francisco • Los Angeles • Seattle • Portland



SHIELDED TYPE H

★ WIRE ROPE AND STRAND ★ FITTINGS ★ SLINGS ★ SUSPENSION BRIDGES AND CABLES ★ AIRCORD, AIRCORD TERMINALS AND AIR CONTROLS ★ AERIAL WIRE ROPE SYSTEMS ★ ELECTRICAL WIRE AND CABLE ★ SKI LIFTS ★ HARD, ANNEALED OR TEMPERED HIGH AND LOW CARBON FINE AND SPECIALTY WIRE, FLAT WIRE, COLD ROLLED STRIP AND COLD ROLLED SPRING STEEL ★ SCREEN, HARDWARE AND INDUSTRIAL WIRE CLOTH ★ LAWN MOWERS

ROEBLING

A CENTURY OF CONFIDENCE

JAR ROEBLING

Announcing

. . . a new West Coast Office for TUTTLE & KIFT

D. B. "Don" Kift

Because of the ever-increasing demand for TK products, a new office is being established at 5309 South District Blvd., in Los Angeles (Phone: Logan 5-1313) in order to give West Coast Manufacturers, Distributors and Dealers the best possible service. It will be under the direction of Mr. D. B. "Don" Kift, Vice-President of the company.

The new West Coast Office will direct the promotion of these two quality products:

1. The TK Monotube—the one-coil heating unit for Electric Ranges. Because of its many features, Mrs. Range Buyer has developed a strong preference for the TK Monotube.

2. The Disc-Type Gas Range Top Burner Valve—approved for use with all types of gases. Manufacturers are fast recognizing the many advantages of this improved Disc Valve.

the T·K MONOTUBE *It stands alone!*

TUTTLE & KIFT, Inc.
1823 N. MONITOR AVE. · CHICAGO 39, ILL.

Floodlights (704)

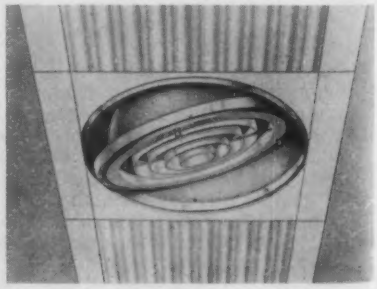
Two general-purpose floodlights for small-area lighting have been added to the G-E line. Type L-82 is rated at 300/500 watts and Type L-83 is rated at 750/1,000 watts. A tightly sealed, hinged door, locked by three clamping lugs, replaces the clamped ring on older types. A new aluminum reflector is designed for higher beam efficiency in accordance with NEMA standards, and a locking handle on the elevation adjustment eliminates need for using wrenches. Both models can be provided with a portable base as well as the slip fitter and pipe clamp mountings.

Lighting System (705)

Benjamin Electric Mfg. Co.'s Sky-Glo is a lighting system of translucent louvers designed to provide a luminous ceiling of light. Sky-Glo louvers are standard unit systems of vertical interlocked self-welded strips made of a special vinylite formula, a Bakelite product. Hung side to side, the units cover the entire ceiling area in geometric arrangements. Light sources and fixtures are completely concealed. The louvers do not alter the color of the light, are acoustically neutral and will not distort under prevailing room temperatures, the manufacturer states.

Downlight (706)

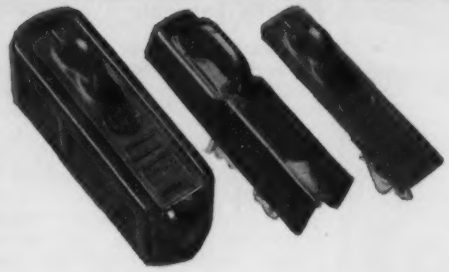
Pittsburgh Reflector Co. is offering a recessed troffer downlight designed for individual, end, corner, cross-over and in-line mounting with standard-width fluorescent troffers. It may be installed in acoustical and other type ceilings. Using a high-efficiency silvered-glass Permaflector and a standard 200-watt incandescent lamp, the light is adjustable in a complete circle up to a 35° angle. Lamp shielding is by concentric louvers. The housing is 12 in. square by 10 in. deep and is equipped with knockouts for attachment to the troffer.



PRIMARY FUSE CUTOUTS

for all service requirements

INDICATING—DROP-OUT—RECLOSING



Interchangeable doors make these enclosed cutouts the most versatile in their field. *Three interchangeable doors*—indicating and drop-out, two-element reclosing, and disconnect—available for each current rating; *fit both the 5-kv and the 7.5-kv housings*. Just five major stock parts, for both 50- and 100-ampere ratings, fill all your requirements. Bulletin GEA-3448-B tells the complete story.

NON-INDICATING

These cutouts, lowest in price of all wet-process porcelain-enclosed cutouts, enable appreciable savings where indication is not necessary.

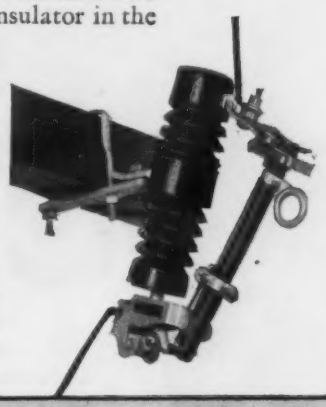
With exceptionally liberal design of contact areas and interlocking barriers, these cutouts are tops in the non-indicating field. More than a million and a half in service have proved their high mechanical and electrical strength, and overall durability. Bulletin GEA-2390-C gives complete information.

General Electric also has a complete line of oil fuse cutouts, secondary cutouts and fuses, and universal conventional and Hi-surge fuse links.
Apparatus Department, General Electric Company, Schenectady 5, N. Y.

Compare each with its field for reliability, performance and flexibility of application!

OPEN-TYPE, DROP-OUT

This is the first "bird-proof" cutout in the open-type drop-out field. The mounting support is cemented into the one-piece solid insulator in the *opposite side* from all live parts—minimizing possibility of bird or animal blowing a fuse by touching a live part and the mounting at the same time. Note the closely coupled fuseholder which can be removed or replaced easily with standard switch stick.



FLIP-OPEN

A low-cost cutout for primary fusing of rural lines where possible short-circuit current is limited. Like the open-type drop-out cutout the Flip-open cutout is virtually "bird-proof." Double-wedge silver-plated contacts grip the fuse link cable. Helical-wound springs retard vibration stresses on fuse link. Like all G-E cutouts, the mounting support is cemented into the porcelain insulator for exceptional strength and durability. Bulletin GEA-4224-A gives details.

GENERAL ELECTRIC

USE BRIEGEL
ALL-STEEL
INDENTER-TYPE
FITTINGS!

Cross Section Showing Indentations.

Select the best, insist on Briegel All Steel Fittings, the only approved Indenter type connectors and couplings for thin wall conduit tubing. You will not only find that Briegel Indenter Fittings are easier and faster to use, but also make neater, stronger connections. Two Easy Squeezes and they're set. Start using Briegel Fittings today. Have more satisfied customers — more profits from each job.

DISTRIBUTED BY

The M. B. Austin Co., Northbrook, Ill.; Clayton Mark & Co., Evanston, Ill.; Clifton Conduit Co., Jersey City, N. J.; General Electric Co., Bridgeport, Conn.; The Steelduct Co., Youngstown, Ohio; Enameled Metals, Pittsburgh, Penn.; National Enameling & Mfg. Co., Pittsburgh; Penn.; Canadian General Electric Company, Ltd.

All B-M Fittings Carry the Underwriter's Seal of Approval and Canadian Standards Ass'n Approval No. 8275.

NEATER • FASTER • STRONGER • APPROVED •

BRIEGEL METHOD TOOL CO.
GALVA, ILLINOIS

Semi-Direct Fixture (707)

McPhilben Mfg. Co.'s Bizone unit is a soft daylight luminous semi-direct fixture for schools, offices, show rooms, stores and commercial establishments. It is made of steel, fitted with white enamel metal baffle, supported by three metal rods which hook into three turned brass knobs. The pendent type is 24 in. and the close-up type is 6 in. to bottom of socket husk. Finish is baked satin aluminum, with satin or polished chrome at additional cost. Glass bowls come in 18-, 20- and 22-in. diameter, with bottom zone daylight blue and upper zones concentric rings of daylight blue.

Plastic Laminate (708)

Laminated Plastics Inc. has a new Fiberglas-reinforced industrial plastic laminate known as Glastic and designed for high-temperature electrical applications. Characteristics listed by the manufacturer are high-temperature resistance combined with good machinability and high impact and flexural strength values, good resistance to delamination, good arc-tracking resistance and low moisture absorption. As insulating panel stock, the laminate will stand long exposure to high temperature without embrittlement or blistering, it is stated.

Utility Box (709)

National Electric Products Corp. has a new "Redege" flush device utility box, No. 2020, which it claims has more finger room, a flat back to eliminate rocking, ears as integral parts of the box. The box is formed of pressed steel and is electrogalvanized throughout. It is 1⅞ in. deep, 4 in. long and 2⅛ in. wide. Eleven flush, smooth ½-in. knockouts are provided, three on the bottom, three on each side and one on each box end. Lugs are tapped on 3⁹⁄₃₂-in. centers for all makes of push button, rectangular rotary switch and flush convenience outlets.

D-C Relays (710)

Square D has added two d-c magnetic multi-pole relays, Type Q, with from 2 to 6 poles, and Type R, somewhat larger and heavier, with from 2 to 5 poles in any combination of normally open and normally closed circuits. Both are suitable for d-c voltages up to 250 volts. They utilize double-break, silver-to-silver contacts, and contact parts are interchangeable with those of the corresponding a-c devices. They are steel panel mounted and insulated to permit direct mounting on a grounded metal panel. All terminals are accessible from the front and are equipped with two wiring clips to accommodate multiple connections.

Connector (711)

Holub is in production with its No. 1 Midget Screw-On wire connector, listed by Underwriters' for 25 individual wire combinations of No. 16 and No. 18 solid or stranded. It is designed for making pig-tail wire joints in all types of electrical equipment; over-all length is ⅝ in.

Purifier (712)

Circlite Corp.'s Pur-Ar-Lite air purifier is of light-weight aluminum, stands 9 in. high and may be hung on an ordinary wall hook; operates on a-c. It is equipped with a special Sylvania 4-watt ozone-producing ultra-violet bulb, with 2,500-hour life.

NOW AVAILABLE...

A Complete Series of Standardized FWD BUILT-TO-CODE Fully Equipped Motorized Units—Engineered For Every Type of Line Construction & Maintenance Service

DEVELOPED from more than twenty-five years of field experience with the needs of utilities, FWD now offers a complete series of specialized line construction and maintenance trucks.

Available in 38 varying but standardized combinations—each designated by individual CODE NUMBER—you can purchase a motorized unit equipped as you want it—with earth-boring machine, integral or T Type derrick, single or double drum winch, platform or compartment body, conventional or 5-man cab — in 3 models of four-wheel-drive trucks in capacities to meet every utility need. And you can simplify your purchasing by buying from a single, centralized source — The Four Wheel Drive Auto Company, who engineer and build the complete motorized unit — truck and component equipment.

For complete information and Code Chart, see Graybar or write to —

THE FOUR WHEEL DRIVE AUTO CO.
CLINTONVILLE, WISCONSIN
Canadian Factory: KITCHENER, ONTARIO

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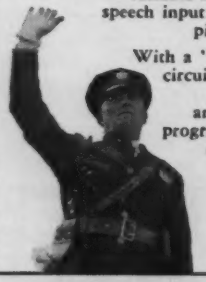
MOTORIZED UNITS
FOR LINE CONSTRUCTION AND MAINTENANCE

Built By

Makers of America's Foremost Heavy Duty Truck

Distributed by GraybaR

Radio "traffic cop" with a good heart!

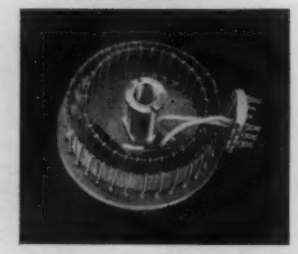


Operating where audio frequencies crowd the thoroughfares, variable attenuators assure precision volume control in speech input equipment for radio consoles, sound motion pictures, public address systems and television.

With a "traffic cop" of this type in each microphone circuit of a multi-microphone setup, input volume of one unit can be faded out while that of another is increased; close-up and background program effects can be reproduced with any degree of contrast desired; and the resultant mixing of all microphone inputs can be smoothly handled, through a master gain control, to meet all variations in program tonal intensity.

To assure top-level performance, the maker, Daven Company of Newark, N. J., specifies that *all* its resistors—"standards in the industry"—be wound with Nichrome* V, Nichrome*, D-H Manganin, or D-H 331 Alloy wire, dependent upon application.

If *you* require electrical resistance wire of outstanding uniformity and high stability, be guided by the example of Daven and send your specifications to us. We will supply the alloy best suited to your needs.



Dependable "heart" of Daven attenuators is Driver-Harris electrical resistance wire.

Driver-Harris Company

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HART MANUFACTURING COMPANY
Remote Control Equipment — Switches — Relays — Thermostats

HAZARD-OKONITE COMPANY
Copperweld, Bronze, Copper, Telephone Wire Division

TRICO FUSE MFG. CO.
Fuses, Oilers, Clip Locks and Fuse Pullers

BURKE ELECTRIC COMPANY
Bakelite Controlead Terminal Blocks

FUSE FACTS

About

TRICO

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RENEWABLE FUSES

TRICO's exclusive "Powder-Packed" . . . CUSTOM-BUILT features give DOUBLE PROTECTION and THREE TIMES THE SERVICE.

"POWDER-PACKING"

- Protects and supports the fusible link . . . no damage—no unnecessary blowings.
- Confines heat, flame & molten metal to the renewal cartridge. No destruction . . . no fire hazards.
- Safe time-lag . . . prevents early deterioration of wiring and motor windings.

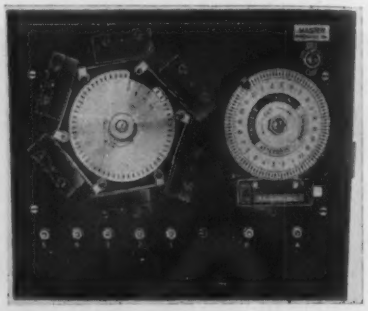
Solid copper leads prevent terminal heating and premature blowings. Tamper-proof and non-interchangeable links for maximum protection and service.

GET ALL THE FACTS—
WRITE FOR BOOKLET 206-A

TRICO FUSE MFG. CO. Milwaukee, Wisconsin

Sprinkler Control (713)

A device to automatically turn sprinklers on and off at regular timed intervals has been developed by Tork Clock Co. This sprinkler switch is suitable for use with all types of overhead or concealed irrigation systems. It provides for multiple circuits operating in sequence for an adjustable period; is available with from 2 to 20 circuits; has a master switch to discontinue operation during rainy weather. Average sprinkling time lasts from 12 to 15 minutes on each branch. The control utilizes magnetic solenoid valves in the water pipe.



Lighting Plant (714)

The new 1,000-watt Katolight lighting plant is powered by a new engine, 2⅝x2⅝-in. bore and stroke, developing 2.6 hp. at 1,800 r.p.m. According to the manufacturer, the governor is so sensitive it holds frequency within less than one cycle variation between partial and full load. It is furnished with a built-in automatic choke, mechanically operated. A feature is accessibility of the ignition contact points. Comes with gravity carburetor with 1-gal. fuel tank or can be furnished with mechanically operated fuel pump. The plant is available with remote or automatic control; will produce a constant source of standard a-c current, for stand-by or sole source of supply, the manufacturer states.

Loom Motor (715)

A totally enclosed Tri-Clad loom motor has been announced by General Electric, covering the entire range of 2 hp., 1,800 r.p.m. and smaller, but with all ratings built in a single frame diameter with two axial lengths. This design permits horsepower or speed ratings on a particular loom to be changed to suit requirements with minimum loom modification. All ratings are available for foot mounting or three-arm suspension.

Switch (716)

A vertical break air switch announced by Delta-Star Electric Co. is known as the MK-40, is of the rotating-blade, high-pressure contact type and is said to incorporate many new features desirable in heavily loaded circuits. Available in all standard voltage and ampere ratings for upright, inverted or vertical mounting.

Fan Control (717)

Paragon has a portable electric timer for automatic control of window and other portable fans. Known as the portable AF, it is identical in construction and appearance with the manually preset AF series, with the addition of the portable feature. It is available in two time ranges, 0 to 10 and 0 to 20 hours.

NOW Ratings Boosted-Delivery Speeded!

ALLIS-CHALMERS STANDARDIZES RATINGS OF 3-PHASE REGULATORS TO 2500 KVA LOWERS PRICES!

★ **Now! Top rating boosted from 750 kva to 2500 kva.** Makes the AFR Feeder Voltage Regulator line the broadest on the market!

★ **Standardization for the first time of units 1000 to 2500 kva!** Now you get advantages of a completely automatically controlled, self contained regulator in standard ratings 75 through 2500 kva, voltages through 69 kv.

★ **New Lower Prices** on units 1000 to 2500 kva. Savings from standardized design and manufacture are passed on to you.

★ **Also! Easier to specify and order!** No special specifications needed. All facts for ordering these standard units — including price — are in the price book.

★ **And good news about delivery!** Expanded facilities and production standardization speed delivery on *all* AFR regulators.

Check 4 Quality Features of the Utility accepted AFR units now regulating more than 5,000,000 kva of U. S. power.

Long life contacts — Generous size increases thermal capacity; special Elkonite RS 1045 — resists pitting, arcing. In addition, contact deterioration is low due to . . .

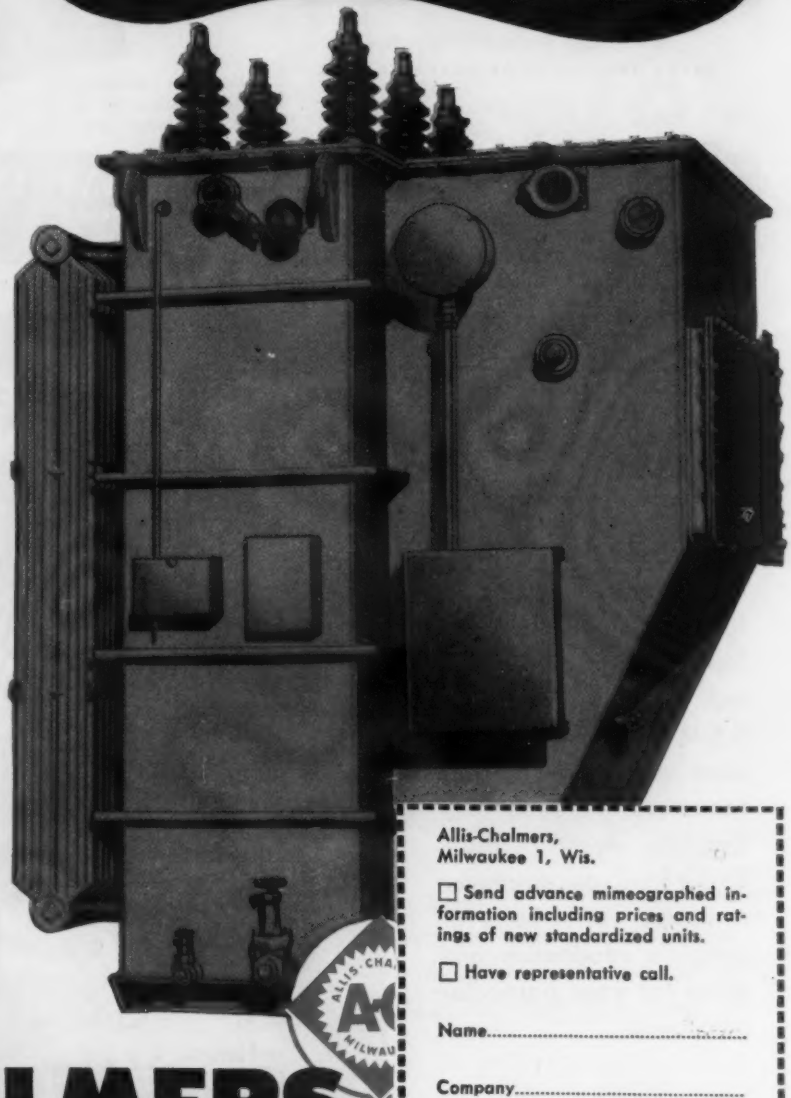
Quick-break mechanism. Operates on balanced spring principle! Fast moving parts snubbed to quick-stand-still after a tap change.

Heavy-duty driving motor — operates under oil — has no commutator, slip rings, brushes, nor centrifugal switch. Withstands stalled current without injury.

Accessible control — Entire voltage control grouped in single hinged chassis for ready accessibility, quick inspection, adjustment.

Note: These same features are standard on DFR single phase regulators, sizes to 6900 v, 250 kva.

A 2493



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☐ Send advance mimeographed information including prices and ratings of new standardized units.

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Precision-Built Electrical Equipment
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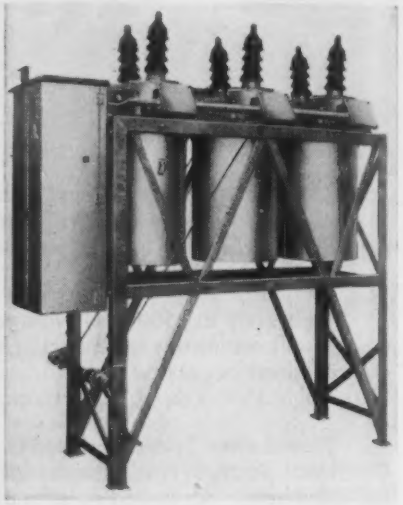
SINCE 1909

Oil Circuit Breaker (718)

Pacific Electric Mfg. Corp. has announced Type JCE oil circuit breaker of medium capacity for outdoor distribution substations. Rapid fault-current interruption within expulsion chambers and extra-fast opening and reclosure by motor compressed spring operating mechanism are said to minimize system disturbance and increase the load capacity of existing lines. If immediate first reclosure is employed, there may be little need of using duplicate feeders to important loads, the company points out.



Panelboard (719)

Square D has a new circuit breaker plug-in panelboard claimed to be easier to wire because of a system of branch circuit terminal marking. The 3-phase, 4-wire arrangement of the panelboard eliminates doubt as to phase identification of branch circuits by including letters A, B and C opposite each branch circuit load terminal connected to the corresponding three phases. Further identification is given by use of a marking strip with black background for phase A, red for phase B and blue for phase C. The connection diagram furnished with each panelboard is printed in corresponding color.

A split bus arrangement provides for distributed phasing of A and B circuits and group phasing of C circuits. Two-pole, 208-volt circuits can be secured in addition to the usual single- or two-pole, 120-volt circuits, by connecting to adjacent A and B terminals. Wiring is simplified by the identification system which indicates phasing with large letter markings and color code. NMO plug-in panelboards are available for both single-phase, 3-wire and 3-phase, 4-wire services with 15-, 20-, 30-, 40- and 50-amp. branch circuits.

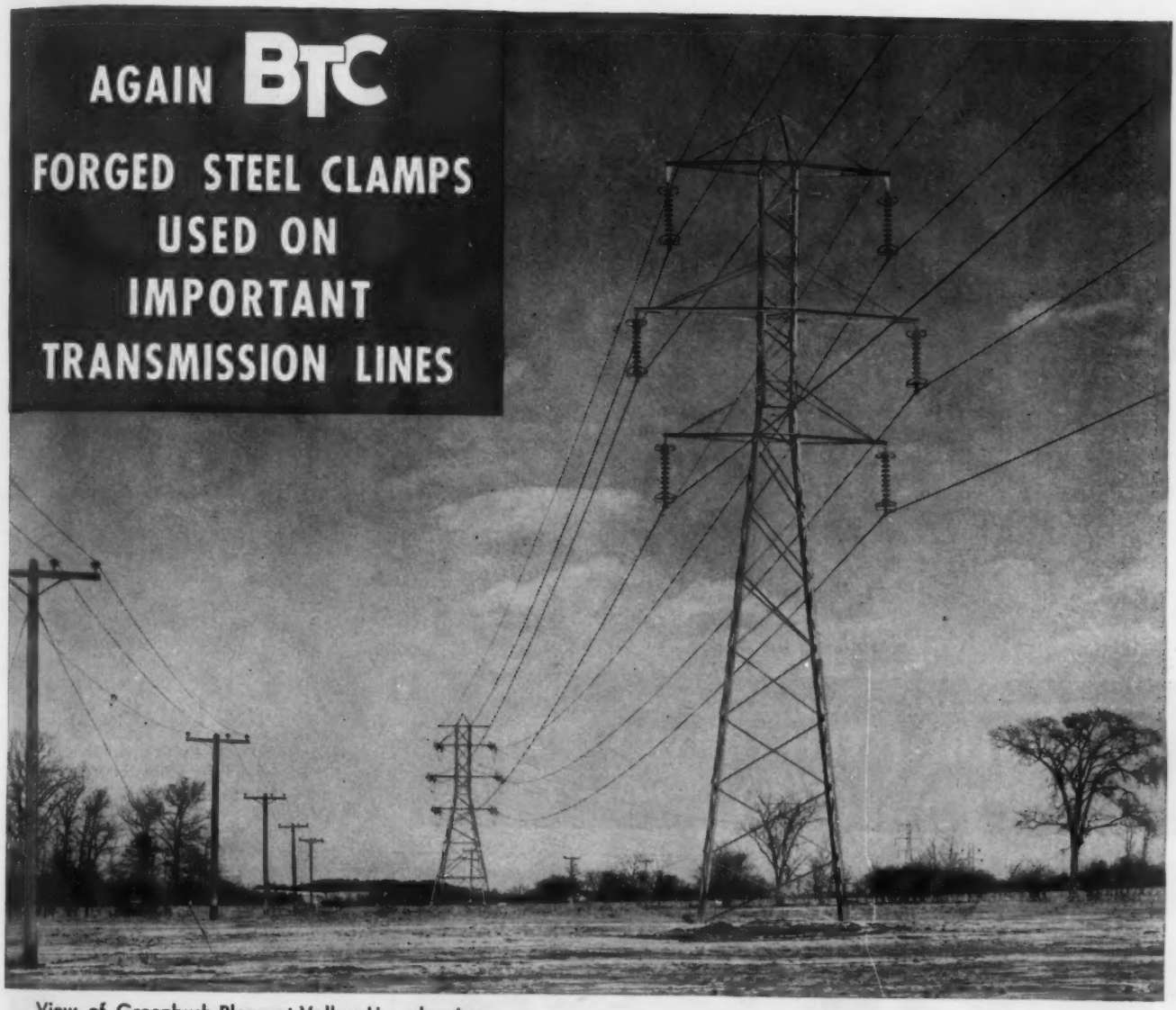
Cable Coating (720)

Dearborn Chemical Co. is offering a protective coating in an adhesive roll for lead-sheathed cables in manholes. Called the No-Ox-Id wrap, the new roll combines corrosion-resistant coating and wrapper; is water repellant; can be applied by one man; is $\frac{1}{32}$ in. thick. Rolls are 2 in. wide; 25 feet long; cellophane wrapped.

Turbine (721)

General Electric has introduced a small, mechanical-drive turbine, Type DP. This machine is rated from 10 to 1,200 hp. with speeds from 1,000 to 5,000 r.p.m.

AGAIN BTC FORGED STEEL CLAMPS USED ON IMPORTANT TRANSMISSION LINES



View of Greenbush-Pleasant Valley Line showing semiflexible "A" frames and square strain tower.

In order to join the Niagara-Hudson system with New York City, the New York Power and Light Corporation constructed a 64-mile tie-line from Greenbush, N. Y. (southeast of Albany) to Pleasant Valley, N. Y. (east of Poughkeepsie). Built in 1931, this 110 kv. line features double circuit galvanized steel semiflexible suspension structures and square strain towers. The power conductors are 605,000 cm. 26/7 A.C.S.R. using armor rods; ground wires are two ½" diameter, extra high strength, 7-strand Copperweld.

Controlled-slip forged steel Suspension Clamps produced by BTC are used throughout this line on the power conductors. BTC Forged Steel Caps are also used on the Suspension Insulators. BTC Forged Steel Line Hardware is selected for important transmission lines because of correct design features and economy in maintenance.

Sold only through your insulator manufacturer.

THE BREWER-TITCHENER CORPORATION, CORTLAND, N. Y.

THE MAGNO-TRONIC FLUORESCENT STARTER

PROTECTS Fully automatic thermal relay with unusually long life that eliminates blinking lights and protects all auxiliary equipment.

SIMPLIFIES Replacement of worn-out lamp automatically restores closed circuit—replacement of starter unnecessary. No button to push.

REDUCES COSTS Magno-Tronic starters provide exact timing in the lamp electrode—preheating process preventing excessive loss of emission material thereby assuring the maximum in the useful life of a lamp. The established quality of this starter saves considerable time in maintenance and man hours required to repair and/or replace an inoperative lighting unit.

VERSATILE Will operate efficiently over an extended voltage under widely varying temperatures.

GUARANTEED FOR ONE YEAR

The (SP-15-20) for use with either 15 or 20 watt lamps
The (SP-30-40) for use with either 30 or 40 watt lamps
The (SP-100) for use with 100 watt lamps

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MAIN PLANT Newark 2, N. J.

Catalog Bulletins on Sherman Soldering Lugs available upon request.

We put a lot of careful workmanship into the production of all Sherman Soldering Lugs. Dimensions are held to consistent accuracy. Lugs are kept free from burrs, corrosion, etc., and special attention is devoted to maintaining FLAT contact surfaces. All lugs individually inspected before shipment.

H. B. SHERMAN MFG. CO.
Battle Creek, Mich.

Sherman
SOLDERING LUGS

Pole Climbers (722)

Adjustable pole climbers, with an extension shank or leg iron that may be set any desired length between 15 and 18½ in., are being made by Buckingham Mfg. Co. This adjustable climber is said to have all the safety features of conventional climbers. It has replaceable gaff construction. Angle of the gaff is claimed to permit the lineman to stand closer to his work with less possibility of cutout.

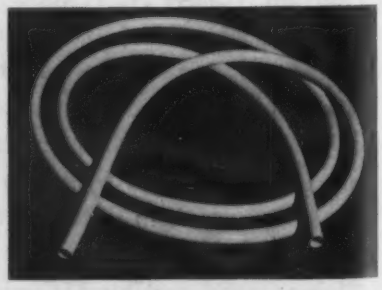
Circuit Tester (723)

General Electronic Distributing Co. has announced an instrument to test all electrical circuits and appliances. This device measures the current consumption of any appliance or utility, either a-c or d-c, and will measure it while the unit is in operation, it is stated. The reading is direct in amperes. An ultra-sensitive direct-reading resistance range will accurately measure all resistances commonly used in appliances and motors, according to the manufacturer. This range will permit continuity checks and tests for shorts and opens; will read to 25,000 ohms.

Spooling Device (724)

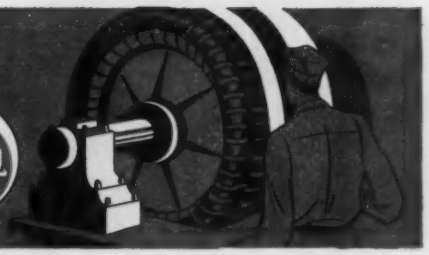
An automatic spooling and tensioning device is incorporated in the new Gar Wood Reel-Rite truck winch. At present the winch is available in a 20,000-lb. model, but the manufacturer plans to start production of additional models, with capacity ratings from 15,000 to 30,000 lb.

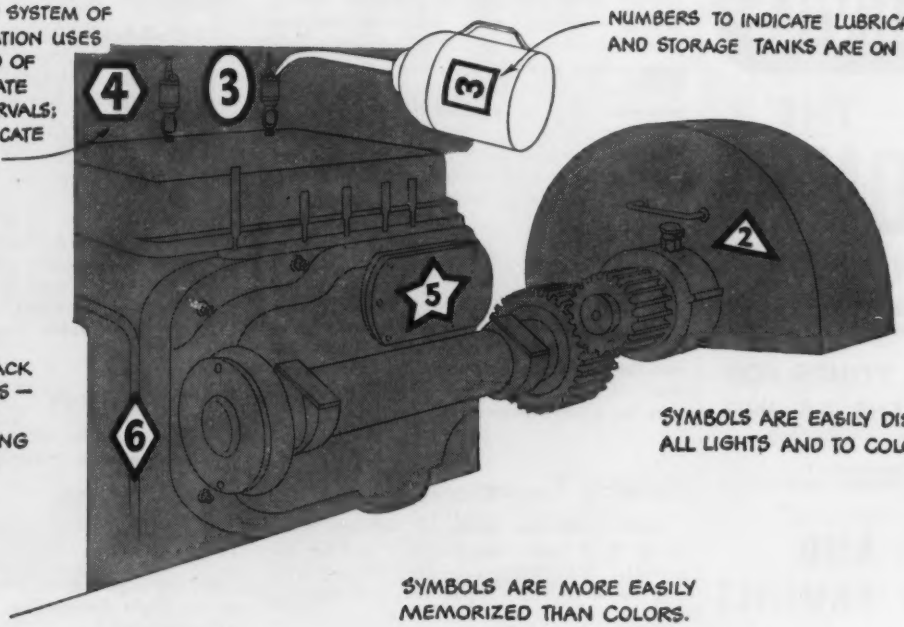
Thermoplastic Tubing (725)



William Brand & Co. has announced Turbo REL-16-A thermoplastic tubing, claimed to have a heat resistance ranging up to 105°C. for continuous operation. It is said to retain flexibility under repetitive baking, potting and solder-iron operations. Factor of porosity is reduced to the practical minimum by a smooth satin-like finish secured from highly densified extrusion compounding.

STANDARD ENGINEERS NOTEBOOK




STANDARD CODED SYSTEM OF PLANNED LUBRICATION USES SYMBOLS INSTEAD OF COLORS TO INDICATE LUBRICATION INTERVALS; NUMBERS TO INDICATE LUBRICANTS.
NUMBERS TO INDICATE LUBRICANTS IN DISPENSERS AND STORAGE TANKS ARE ON SQUARE DECALCS.
ALL SYMBOLS AND NUMBERS ARE BLACK ON WHITE DECALCS — VISIBILITY IS NOT IMPAIRED BY FADING AS WITH COLORS.
SYMBOLS ARE EASILY DISTINGUISHABLE IN ALL LIGHTS AND TO COLOR-BLIND PERSONS.
SYMBOLS ARE MORE EASILY MEMORIZED THAN COLORS.

Free coded marking system stops lubrication mistakes

Here's a coded system of planned lubrication, developed by Standard of California's technical service, for plant and truck and car fleet operators in the Seven Western States. It will minimize breakdowns and maintenance costs wherever industrial machinery is used and lubricated.

By employing symbols instead of colors to indicate lubrication intervals, mistakes caused by color-blindness are completely eliminated...and chances of errors due to colors fading or changing appearance under different lighting conditions are avoided, too.

The symbols on decalcs indicate lubrication intervals; numbers inside the symbols indicate lubricants to use.

Standard Fuel and Lubricant Engineers or Representatives will install the Standard Coded System of Planned Lubrication in plants or for fleets at no charge. Decalcs, record charts for each machine, everything needed will be supplied absolutely free.

For this service or lubrication help of any kind in the Seven Western States, call your local Standard Representative in that area or write 225 Bush Street, San Francisco 20, California.

Trademarks "Calol," "RPM," Reg. U. S. Pat. Off.

STANDARD TECHNICAL SERVICE will make your maintenance job easier. If you have a lubrication or fuel problem, your Standard Fuel and Lubricant Engineer or Representative will gladly give you expert help; or write Standard of California, 225 Bush Street, San Francisco 20, California.

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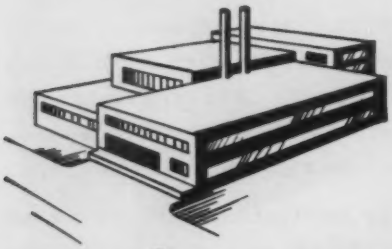
GENERATOR BRUSHES

are an important factor for good, steady performance. We, at "Ohio" have for many years rendered this charting service, free of charge, to American Industry. Our engineers go wherever your motors are located in your plant and make the proper brush recommendations which findings are incorporated into a bound chart facilitating easy ordering. Regardless of make of motor or generator you order by page number from the chart.



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BULLETINS ETC.

Radiant Heat (726)

Radiant heat processing for metal-working, plastics, textile, leather, graphic arts, paper, food, woodworking, building, glass and bottling, rubber and other industries are described in a new booklet "Modern Baking, Drying, Heating with Industrial Infrared Lamps" announced by Westinghouse. Case histories are given to show how infrared cuts costs, speeds production and saves space wherever heat is required for dehydrating, finish baking or mass heating. A check list of applications for which it is now being used names more than 70 operations and processes in a wide variety of industrial plants.

Wire Catalog (727)

Rockbestos Products Corp. is offering a new catalog and handbook, the No. 10F, which supersedes its 10E. The new edition is enlarged and lists the company's complete line of more than 125 wires, cables and cords. It has index tabs for quick reference.

Catalog Sheets (728)

Roller-Smith has published catalog sheets on its RD temperature indicator and SA a-c ammeter with mounting bracket. The company also has a revised "Hipot' indicator catalog.

Lighting Catalog (729)

A 28-page pocket catalog, No. 325, has been prepared by Mitchell Mfg. Co., listing and illustrating its complete lighting line.

Connectors (730)

Cannon Electric Development Co. has issued a new edition of its condensed catalog. Designated the C-47 edition, it contains 32 pages in three colors, covering the 13 major type series of multicontact electric connectors for radio, aircraft, communications, etc., with prices on all except the "AN," "K," and "DPD" series.

Insulation (731)

Mitchell-Rand Insulation Co. is offering a handbook of compounds and waxes for electrical insulation. Included are physical characteristics, active formulas, suggested applications, etc.

Transformers (732)

A complete line of dry-type transformers designed to provide efficient operation of motors, lights and other electrical equipment requiring 120-240 volts is described in a 12-page booklet (B-4009) announced by the Westinghouse Electric Corp.

Building Wires (733)

Harard building wires are described in a new publication of Hazard division of Okonite Co.

Lighting (734)

Silvray Lighting, Inc., has issued a bulletin on its Sight Savers line. Units are pictured and described.

Trolley Frog (735)

Ohio Brass has issued a catalog sheet on its Type-M trolley frog.

Motors (736)

U. S. Electrcial Motors has prepared a bulletin on its late model Syncrogear motors. Sizes of these motors range from 1/4 to 30 h.p.; speeds from 10 to 10,000 r.p.m.

ELECTRICAL WEST, 68 Post St., San Francisco 4, California
Please send me information about following CIRCLED items:

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708	709	710	711	712	713	714	715
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732	733	734	735	736			

Name . . . . . Company* . . . . . Title* . . . .

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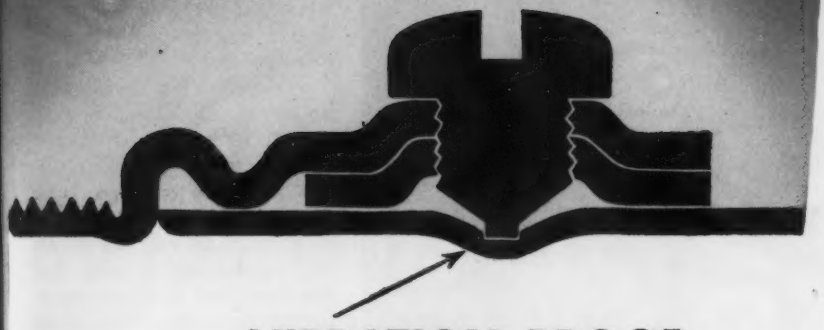
* Please include your company's name and your position, as we cannot ask manufacturers to furnish literature unless you do.

New IMPROVED FITTINGS for E.M.T.

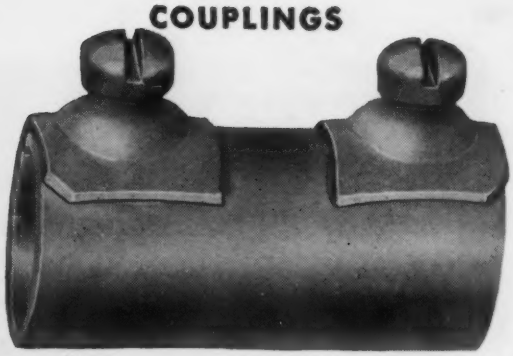
BY

National Electric



VIBRATION PROOF

COUPLINGS



LOOK AT THESE ENGINEERED FEATURES

- Easy to Inspect
- Simple, Strong Pressed-Steel Construction
- Permanent Ground
- Conduit Stop
- Electro-Galvanized Throughout
- Uniform, Safe Holding Action
- No Wrench Strains on Boxes
- No Special Tools Required
- Easy to Install with only a Screwdriver
- Close, Accurate Fit
- Economical . . . Re-usable . . .

APPROVED BY UNDERWRITERS' LABORATORIES, INC.

For your reputations' sake, complete the job with NE Conduit Junior EMT Conduit, Rectangle Boxes and NE Wire

NATIONAL ELECTRIC PRODUCTS NE WIRING SYSTEMS 6 WIRES AND CABLES

Sold through leading electrical wholesalers

National Electric Products Corporation
Pittsburgh 30, Pa.

EASY TO INSTALL IN CLOSE QUARTERS AND IN CORNER LOCATIONS!

CONNECTORS

Steel for Permanence

Grounded for Safety

ELECTRA'S HUSBAND

KEEP IT DARK

LIKE a hot breath, *demand* is scorching the neck of *supply* of electricity in many places in this West of ours, even though the drought has been drowned by subsequent, and be it said, unceasing rains. (And floods.) There is still some danger, however, that the winter loads will be too much for the generators and some curtailment of use may have to come.

At the Victoria meeting of the Northwest Electric Light & Power Assn., a telephone man told us what we ought to do about it. Coming from a telephone public relations and advertising man, it deserves really serious consideration, for if anybody has done a good job of asking the public to be patient through a shortage, the telephone companies have.

"Make darkness popular," is his theme.

Here we have been selling light all this time. With no light to sell, turn the sales forces loose to sell darkness —and take a load off the peak. With a little advertising, darkness could be promoted very easily. In fact the younger set is for it already, and they are future customers. Even Electra seems to prefer romantic candle light to real illumination. The thing could be done in a really big way—ads, radio time, black billboards, blackout games, booklets in Braille.

N. F. Pullen, the B. C. Telephone Co. ad genius, even described some of the details. The advertisements could be put out at very little expense. They would all carry the same art work or illustration, thus saving cost. It would be a blob of dark. Since you couldn't see in the dark, it wouldn't matter what the illustration was anyway. Nor the text.

But think of the slogans that you could use! Here are a few just to illustrate the possibilities:

"The Darker the Dark—the Greater the Lark."

"Dim the Glim—With Him!"

"Why Look Into Her Eyes?
Feel for Her Ears Instead."

"Be a Loafa
On the Sofa
In the Friendly Dark."

"Darkness—
Serenity—
Opportunity—."

"Bathe the Room—
In Happy Gloom."

Make a game of it. There could be a game book given away free with each kilowatt saved. Such snappy titles as these could be used:

"Be a Dim-Wit
Stage a Blackout Party."

"Prowl in the Dark—
Scare Hell Out of Your Wife—
It's Fun!"

Also there might be contests, with such slogans as:

"Reduce the Use of Juice."

Over the radio, spot announcements might ask:

"Pardon us, but is your filament glowing?"

Or singing commercials:

"They laughed when we sat down at the damsite.
We'd forgotten to build the dam thing."

Officials of the company could give talks with such snappy titles as:

Watts-a-Matter with the Power" or *Why There's Not Enough Juice Loose.*"

For, as helpful Mr. Pullen concluded, "It's a *global* war, Mazda's in de cold, cold ground. He went out like a light."

IN connection with one of the electrical leagues of the West there is a radio interference service. People with sets that hiss and crackle complain to the power company and are referred to this bureau. Naturally a number of such complaints spring from some defective electrical device in the complainee's own home.

The girl who answers the phone usually asks a number of questions to suggest things the complaining person may do to check these possible causes of interference. She asks if there are any appliances in use, and whether they are automatic, for thermostats often cause a crack when they go on or off.

One woman was thus questioned and was asked if perchance she had a heating pad operating. The answer was "yes." So the girl at the bureau suggested that she turn it off and see if that would cure the radio noise.

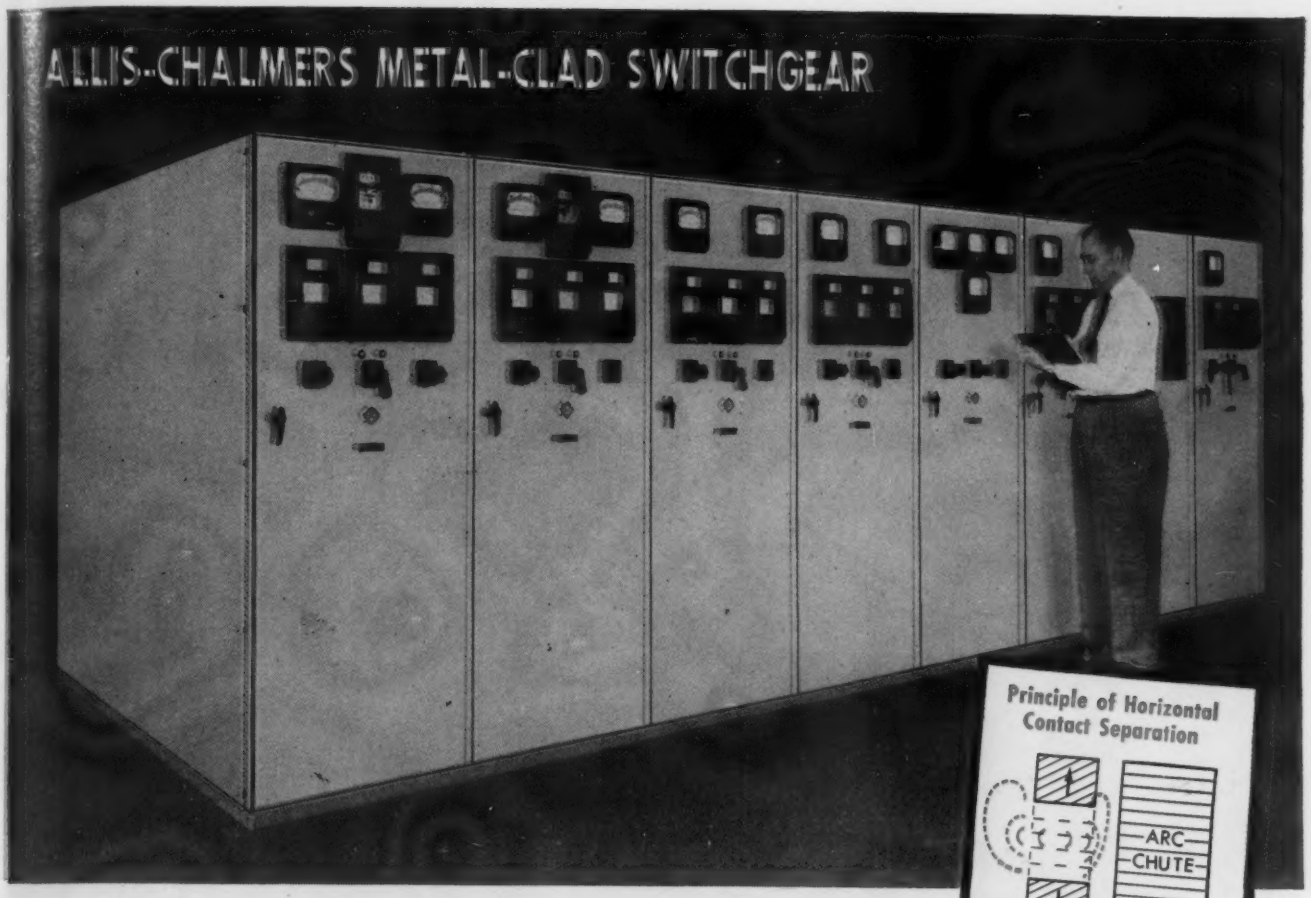
"Oh no, I couldn't do that," exclaimed the woman at the other end of the phone. "I am hatching duck eggs with it."

And then there was the woman who said her radio was all wrong. She couldn't get any radio conception with it at all.

ELECTRA said that she could hardly wait 'til we get television.

The other woman said she had seen television and it was all wrestling and boxing and she wouldn't have it in the house.

In a couple of sentences that is the situation with television today. Those who haven't seen much of it yet and have heard a lot about it are still eager for it. Many who have "seen it" are disappointed because of the character and the quality of its videocasts.



Horizontal Arc Interruption

Gives You Long Contact Life, Positive Interruption, Easy Contact Inspection

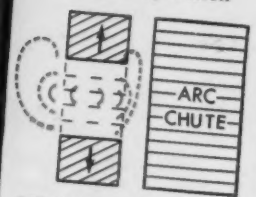
IN A RECENT SURVEY, engineers named horizontal arc interruption as a top feature of Allis-Chalmers metal-clad switchgear. It's easy to see why.

Horizontal arc interruption minimizes contact burning, adds contact life, because arc is forced up and away from the contact points. You can be sure of positive interruption because the arc itself generates the heat to create the natural thermal effect that assists arc into arc chute. Contacts are easily inspected by removing bolts and raising arc chute.

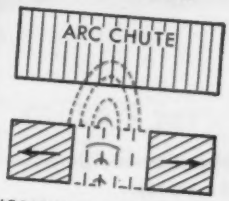
This kind of sound engineering throughout A-C switchgear insures the first requirement of protective electrical equipment — dependability. For more information, write: ALLIS-CHALMERS, MILWAUKEE 1, WIS.

A 2490

Principle of Horizontal Contact Separation



VERTICAL SEPARATION . . . Heated gases are not readily removed from area of insulating break. A complex interrupting system is required to blow arc into arc chute.



HORIZONTAL SEPARATION . . . A natural thermal effect assists the arc into the arc chute. Natural forces accelerate the dissipation of gas from around the break area.

HERE ARE 5 OTHER PREFERRED FEATURES:

RUGGED CONSTRUCTION . . . rigid, self-supporting structure of steel angles and formed plates is lap-welded. Only two full length channels required for simple four point support. Result: only four point alignment necessary.

A-C DESIGNED arcing contacts of high melting point alloys minimize burning, assure low maintenance, long life under repetitive duty.

CONTACT FINGERS on removable element permits easy inspection and maintenance without de-energizing the main bus.

PREDICTABLE low installation costs . . . unit is "packaged" ready for connection. Detailed drawings provided for each installation.

ADEQUATE BUS INSULATION . . . no-corona tape, bakelized paper tubing, insulating tape eliminates compound-filled joints. Easily installed in field and removed for installation changes.

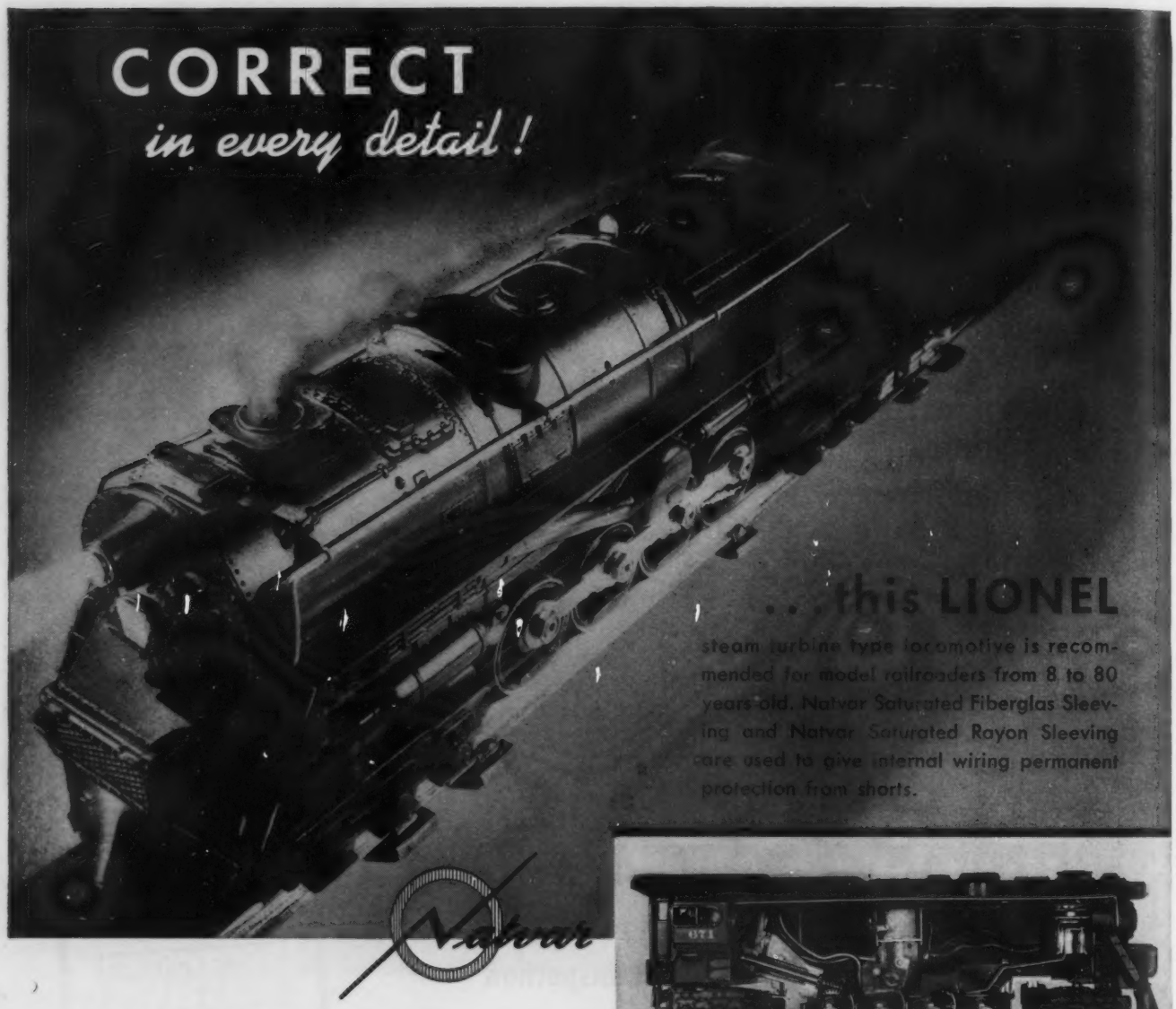
ALLIS-CHALMERS builds these circuit breakers: Air Blast, *Ruptair* magnetic air, *Ruptor* oil units, Low Voltage.

Ruptair and *Ruptor* are Allis-Chalmers trademarks.

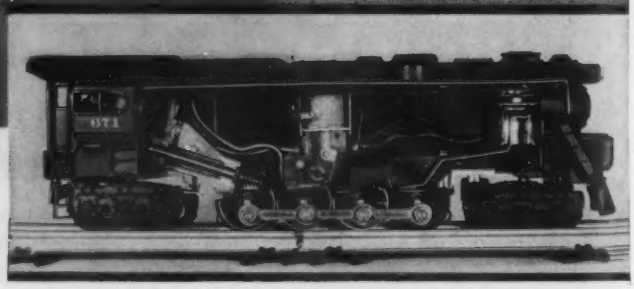
ALLIS-CHALMERS

First in the U. S. with Metal-Clad Switchgear

CORRECT *in every detail!*



. . . this LIONEL steam turbine type locomotive is recommended for model railroaders from 8 to 80 years old. Natvar Saturated Fiberglas Sleeving and Natvar Saturated Rayon Sleeving are used to give internal wiring permanent protection from shorts.



Natvar Products

- Varnished cambric—straight cut and bias
- Varnished cable tape
- Varnished canvas
- Varnished duck
- Varnished silk
- Varnished special rayon
- Varnished Fiberglas cloth
- Silicone coated Fiberglas
- Varnished papers
- Varnished tubings and sleevings
- Varnished identification markers
- Lacquered tubings and sleevings
- Extruded vinyl tubing
- Extruded vinyl identification markers

Ask for Catalog No. 21

Trains and accessories built by The Lionel Corporation are a source of satisfaction not only because they *look* authentic, but because they actually operate for years, absorbing the shock of collisions, derailments, wrecks, and still surviving to run on schedule for the next generation—that is, if the youngsters can get the controls away from their parents.

Natvar Saturated Fiberglas and Natvar Saturated Rayon Sleevings are used on internal circuits because they give ample and uniform protection, and because they are smooth and easy to apply.

If your requirements call for insulating materials with good physical and electrical performance characteristics, it will pay you to use Natvar. Get in touch with your Natvar distributor, or with us direct.

Represented by Electrical Specialty Co.

San Francisco 3	Los Angeles 13	Portland 5	Seattle 1	Denver 2
316 Eleventh St.	418 East Third St.	1215 S.W. 16th Ave.	2406 First Ave.	1015 - 21st St.

THE NATIONAL VARNISHED PRODUCTS Corporation

TELEPHONE RAHWAY 7-2171

CABLE ADDRESS NATVAR: RAHWAY, N. J.

233 RANDOLPH AVENUE ★ WOODBRIDGE NEW JERSEY

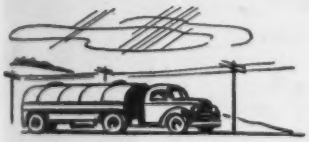
BIGGER rural loads BETTER urban service with G-E 2-Way Radio

G-E mobile installation fits neatly into trunk of supervisor's cars. Note control panel below dashboard. Neat, rubber-covered handset wire coils compactly when not in use.

W. S. WILDER—Technical Assistant to Chief Electrical Engineer, Wisconsin Electric Power Company

"G-E radio gives us fast, dependable communication for critical maintenance work. This means better service for our customers at all times."

At G-E remote control console in headquarters, A. P. Schupmehl, Supervisor, sends out a call to cars.



Transmitter house and 260-foot FM antenna tower on hill near Milwaukee. High ground and lofty reach of this antenna gives station maximum range for the area. Transmitter is G-E FM 250-watt.

• The Wisconsin Electric Power Company serves Milwaukee and nearby cities. The company also distributes power through its feeder lines to hundreds of farms in the Dairy State. Today Wisconsin farmers are using more and more electricity daily for milking, separating and processing of dairy products.

To keep rural lines open, utility service trucks are on the alert at all hours. General Electric 2-way radio in these vehicles saves valuable time, permits dispatching to critical points instantly, easily, in any weather.

Electrical utilities throughout the United States and Canada put their confidence in G-E communication equipment.

General Electric will provide a complete radio system to fit your requirements—to help you give best service to your utility customers.

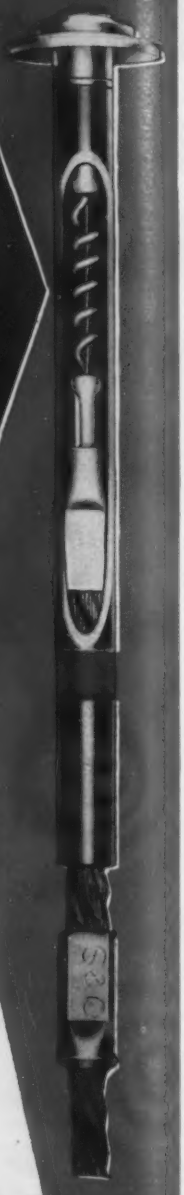
For complete information on 2-way mobile radio, call the General Electric office nearest you, or write: *General Electric Company, Transmitter Division, Electronics Park, Syracuse, N. Y.*

LEADER IN RADIO, TELEVISION AND ELECTRONICS

GENERAL ELECTRIC

163-G2U-6919

THE "NON-DAMAGEABLE" FUSE LINK



In 7- to 200-ampere S & C Fuse Links, the "non-damageable" feature results from the solderless jointed fusible element of pure silver, a metal which has low fusion-time to melting-time ratio, and during fusion—short of actual severance—does not change cross-sectionally, also from the helical coil construction which precludes corona corrosion, and permits sudden thermal expansion without damaging stresses.

Even the smallest S & C Fuse Link is never "damaged" by lightning or other high current surges that may happen to raise the temperature of the fusible element to a point within the melting range but short of complete fusion (severance). It is not subject to corona and corrosion, and not impaired by vibration, abrasion, and strain incidental to ordinary handling or application conditions.

This "non-damageable" nature of the S & C Fuse Link insures permanence to the accuracy of time-current characteristics, which in turn permits "balanced" distribution transformer fusing, i. e., equal and judicious consideration to:

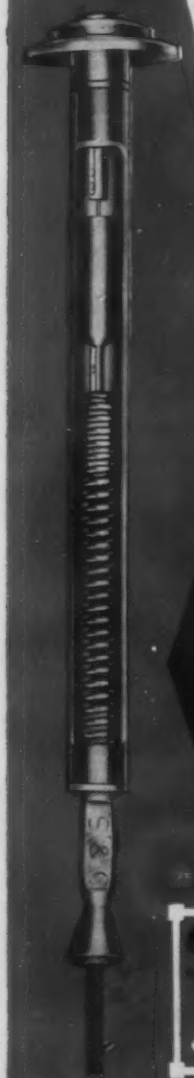
(a) Close, permanently reliable coordination **with primary sectionalizing and secondary protective devices;**

(b) Adequate secondary short circuit protection **for transformers;**

(c) Minimization of unnecessary fuse blowings **from transient faults and lightning surges.**

In addition, the "non-damaging" feature precludes any necessity for replacing "suspect" fuses after high current surges.

For several years these important advantages have been appreciated by a constantly increasing number of the larger electric utilities. Bulletin 218-B tells more of the story.



In 1- to 5-ampere S & C Fuse Links, the "non-damageable" feature is secured from a corona-shielded, high resistance, solderless jointed fusible element which resists electrical, mechanical, and chemical deteriorating influences, and is held under non-additive pretension permitting rupture at a temperature lower than that where marked elongation could take place—also nullifying tension variations imposed by cutout.

S & C ELECTRIC COMPANY
4425 Ravenswood Avenue
Chicago 40, Illinois, U. S. A.
Formerly SCHWEITZER & CONRAD, INC.
. E. Cunningham & Son, Los Angeles; George E. Honn Co., San Francisco; Thos. S. Wood, Seattle

JULY 1948 Vol. 101, No. 1

ELECTRICAL WEST

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED SECTION OF THE U. S.

RATIONALIZED FEDERAL POWER DEVELOPMENT

Thomas M. Robins*

Brigadier-General, USA-CE (Ret.)
Consulting Engineer

DEVELOPMENT of our water resources has become so much a matter of national concern, and now involves works of such magnitude, that progress is mainly dependent upon construction, in accordance with basin-wide plans approved by the Congress, of federal multiple-purpose projects. These projects involve stream improvement for some, or all, of the following purposes: domestic water supply, irrigation, navigation, flood control, power development, recreation and abatement of stream pollution. In most instances one of the purposes for which the project is built will be predominant but it will seldom be economically feasible to limit the use of a site to a single purpose. Revenue from sale of electric energy generated at these projects has become a most important factor in connection with their self-liquidation.

The situation I have just outlined constitutes a legitimate field—and the only legitimate field—for power production by the federal government. Operations in this field by federal agencies, already extensive, are governed by a succession of laws enacted by the Congress over a period covering almost three decades. The most important of these laws to be considered are: the Federal Water Power Act of 1920, the River and Harbor Act of 1927, the TVA acts of 1933 and 1935, the REA Act of 1936, the Bonneville Act of 1937, the Flood Control Act of 1938, the Reclamation Act of 1939, the Flood Control Act of 1944, and the River and Harbor Act of 1945.

In all the laws just mentioned, provision is made for giving preference in the use of power to public bodies and cooperatives. Both the Tennessee Valley Act of 1933 and the Bonneville Act of 1937 provide specifically that power disposal shall be for the particular benefit of domestic and rural consumers and that contracts for the sale of power to privately owned utilities shall contain: (a) stipulations concerning resale rates, (b) provisions for cancellation upon five years' notice if power purchased is likely to be needed by public bodies or cooperatives. In addition, the Tennessee Valley Act of 1933 provides that sale to and use of power by industry shall be a secondary purpose to be utilized principally to secure a sufficiently high load factor and revenue returns which will permit domestic and rural use at the lowest possible rates.

In the Tennessee Valley, as everybody knows, federal power development, including transmission and distribution, is under exclusive jurisdiction and control of a government corporation empowered by law to do most anything it considers necessary for the economic and social well-being of the people living in the river basin. However, the TVA is required by law, in order to make its power projects self-liquidating, to sell electric energy at rates which will produce gross revenues in excess of cost of production, and to pay to states in which power projects are located five per centum of the gross proceeds of the sale of power therefrom. At the end of each calendar year the TVA must pay into the Treasury of the United States the proceeds from sale of power and from any other activities of the corporation, but a loop hole in the law permits the TVA to retain such part of the proceeds as it considers necessary to use in conducting its utility business and manufacturing enterprises.

Surplus power produced at federal water conservation projects elsewhere than in the Tennessee Valley is by law transmitted and sold under direction of the Secretary of Interior even though some of the projects are built and operated by the Corps of Engineers of the War Department. In administering the power features of irrigation projects the Secretary of Interior normally operates through the Bureau of Reclamation. The Bonneville Power Administration which operates in the Columbia Basin is an agency of the Interior Department. So is the Southwestern Power Administration which operates in the Arkansas and Red River valleys.

In regard to sale of electric energy produced at irrigation projects the Reclamation acts require the Secretary of the Interior to establish "such rates as in his judgment will produce revenues at least sufficient to cover an appropriate share of the annual operation and maintenance cost, interest on an appropriate share of the construction investment at not less than three per cent per annum and such other fixed charges as the Secretary deems proper." In the category of "other fixed charges" falls repayment without interest of that part of capital investment in irrigation features of the project which is beyond the ability of the farmers to pay. Receipts from sale of electric energy used to repay with interest the capital investment in commercial power are deposited in the Treasury of the United States. Those used to repay without interest a part of the capital investment in irrigation works are deposited in the reclamation fund.

Power produced at river and harbor and flood control projects under jurisdiction of the War Department is by law turned over to the Secretary of In-

* From an address before the Pacific Coast Electrical Association, San Francisco, June 18, 1948.

terior for transmission and sale. He is required to do this in such a manner as to encourage the most widespread use of power at the lowest possible rates consistent with sound business principles. The law makes it plain that there shall be constructed or acquired, "only such transmission lines and related facilities as may be necessary in order to make the power and energy generated at said projects available in wholesale quantities for sale on fair and reasonable terms and conditions to facilities owned by the federal government, public bodies, cooperatives and privately owned companies." Rate schedules must be drawn with regard to recovery of the cost of producing and transmitting the electric energy sold, including amortization of the capital investment allocated to power over a reasonable period of years, and can not become effective until approved by the Federal Power Commission. All moneys received from sale of power must be deposited in the Treasury of the United States as miscellaneous receipts.

Reasonable Interpretation

The laws governing federal power development were enacted by the Congress with the expectation that they would be interpreted with reason and tolerance and that they would be administered with fair dealing and due regard to economics. This expectation has not been realized. In the case of the TVA it is clearly the intent of the law that a proper proportion of the capital investment should be allocated to power projects and that these projects should be made self-liquidating. This has not been done. Flood control benefits have been grossly exaggerated to reduce the capital costs allocated to power, and interest charges on capital investment are ignored in computing the revenues necessary to make power projects self-liquidating.

When the Reclamation Act of 1939 became law it was, I think, the understanding of most of the members of Congress that the capital investment in power facilities at irrigation projects should be repaid into the Treasury of the United States with interest at three per cent over an amortization period of not to exceed fifty years. It was also generally understood that revenues that could be secured from sale of power generated at irrigation projects, over and above the amounts needed to cover operation, maintenance, replacements and fixed charges, would be used to liquidate irrigation costs which farmers were unable to bear. However, in pursuit of the fetish of cheap power, the Interior Department has interpreted the law to mean that interest on first cost of power facilities should not be paid into the Treasury, but applied to repayment of a part of the first cost of irrigation works. Amortization periods much longer than fifty years are advocated and used in some instances.

Notwithstanding the provisions of the Flood Control Act of 1944 which requires the disposal of power from federal projects to be consistent with sound business principles, the planning and operations of the BPA and SPA are motivated by political, rather than economic, considerations. Transmission and distribution facilities are being built far in excess of what is necessary to make the power and energy available in wholesale quantities for sale on fair and reasonable terms and conditions to existing public bodies and cooperatives. An active campaign is being waged to promote formation of new public bodies and cooperatives. In the sale of power to privately owned utilities a determined effort is made to burden contracts with discriminatory terms and conditions. In short, the laws governing federal power development are apparently being administered by the Interior Department with a view to socialization of industry throughout the United States.

If properly administered and supplemented by appropriate additional legislation, existing laws dealing with conservation of water resources could well be used as the framework of a rational basis for federal power development. Proper administration of the laws can promptly be secured by a thorough housecleaning in certain government departments and bureaus. The enactment of appropriate supplemental legislation will involve careful consideration by the Congress and require some time. This legislation should apply to any and all federal agencies, including TVA, and might, among other things, contain the following provisions:

Legislative Provisions Outlined

(1) The federal government will participate in power production and transmission only in connection with the construction of multiple-purpose water conservation projects.

(2) Five per centum of the gross proceeds received from sale of surplus power from any federal project shall be paid annually to the state or states in which the project is located in lieu of taxes.

(3) In marketing surplus power and energy from federal projects there shall be constructed or acquired only such transmission lines and related facilities as may be necessary to make such power and energy available in wholesale quantities at transmission voltages to facilities owned by the federal government, public bodies, cooperatives and privately owned companies on fair and reasonable terms.

(5) Prior preference in the sale of surplus power and energy from federal projects shall be given only to those public bodies and cooperatives engaged in the utility business that come under regulation of state public utility commissions. All public bodies and cooperatives purchasing such surplus power and energy shall pay a surcharge over established rates in lieu of federal income taxes.

(5) Rates for the sale of surplus power and energy from any and all federal projects shall not become effective until approved by the Federal Power Commission and shall at least be sufficient to cover: (a) cost of maintenance and operation of power production and transmission facilities; (b) payments to states in lieu of taxes; (c) interest on the capital investment allocated to power at the rate of two and one-half per cent per annum; (d) amortization of capital investment allocated to power over a period of fifty years; (e) cost of interim replacements of power facilities; (f) repayment over a period of fifty years of any capital costs not allocable to power, but which must be repaid from power revenues in order to make projects self-liquidating.

(6) All proceeds from the sale of power shall be deposited in the Treasury of the United States as miscellaneous receipts except those needed to repay irrigation investment assigned for return from power revenues. The latter shall be deposited in the Treasury to the credit of the reclamation fund.

New Legislation Needed

New legislation substantially as I have just outlined is, in my judgment, necessary to safeguard the public interest and prevent the undermining of our representative form of government. Continued expansion of federal power production facilities through the building of fuel burning plants is nothing short of rank socialism. It would be highly desirable if all the surplus power produced at federal projects could be sold at the switchboard, but since this is hardly practicable, the next best thing is to make sure that transmission facilities are not expanded into distribution facilities.

There is no good reason why the federal government should promote, encourage or subsidize public bodies and cooperatives to engage in the sale and distribution of power without the assurance of a finding of public convenience and necessity, and proper

regulation, under the laws of the states. It should also be taken into account that the great majority of the consumers of electric power and energy in the United States pay rates which include a component to cover federal income taxes levied upon privately owned utilities. Fairness and justice demand that a like component should be included in the rates for sale of surplus power from federal projects to public bodies and cooperatives. Otherwise, a minority will continue to enjoy tax relief at the expense of the majority of the citizens of the United States.

It should be stated in the law once and for all, and in plain language, what the rates for the sale of surplus power produced at any and all federal projects should be sufficient to cover in order that these projects shall really be self-liquidating. Likewise it should be made certain that the proceeds from the sale of power get back into the national treasury instead of being squandered on ideologies.

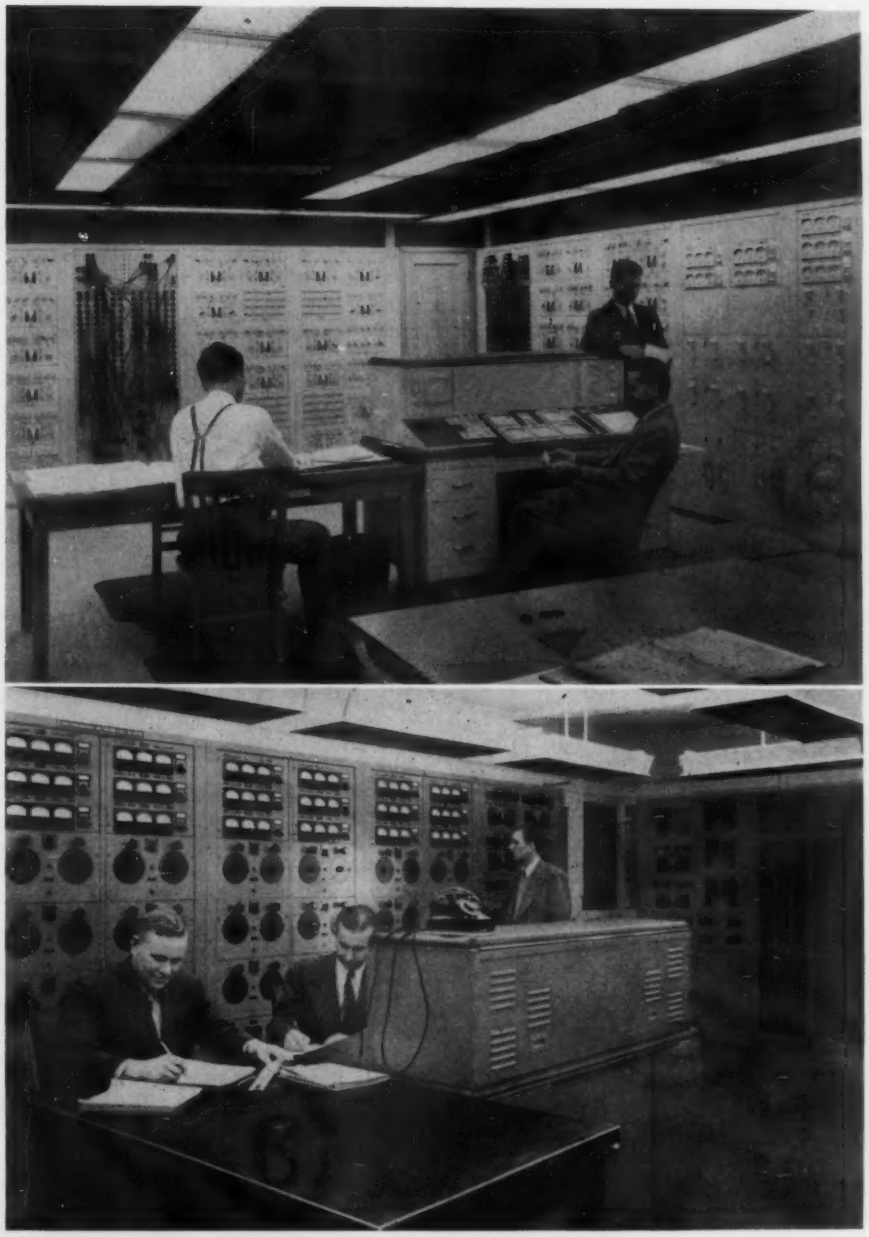
In conclusion, I want to make it clear that I do not presume to know all the answers to the complex questions involved in establishing a rational basis for federal power development. However, it seems clear to me that our system of free enterprise is doomed unless something is done without delay to put federal participation in power production and transmission, and the operations of public bodies and cooperatives, on a business basis which will be fair to all taxpayers in the United States no matter where their homes may be.

NEW A-C ANALYZERS FOR THE WEST

Two new a-c network analyzers have just been installed on the West Coast, one by Pacific Gas and Electric Co., the other by the Department of Water & Power of the City of Los Angeles. Rapid expansion of power systems of the West has made necessary more of these new tools in the hands of individual utilities. The only a-c calculating board on the Pacific Coast prior to the installation of these new boards was that of the Bonneville Power Administration at Portland.

The Westinghouse a-c network analyzer installed by PG and E, shown in the upper view, has 14 generator units with space for 18. Total number of all units on the board is 324. A feature of the board is an electronic voltage regulator. Dr. A. Tilles, in charge of the board, had this to say concerning its use: "Our board was put into full service as soon as it arrived. It is being used at this time primarily for studies of power flows to ascertain suitable connections for the company's extensive program for new power plants and transmission lines."

The Westinghouse a-c network analyzer of the Los Angeles Department of Water & Power, shown below, has 18 generator units, with 266 units in all. This board has a special low-impedance generator unit. The board has been used for preliminary studies on problems of transient stability, short-circuit duty, load distribution and utility interconnection. According to Dr. E. L. Kanouse, transmission system engineer in charge of the equipment, the network analyzer bids fair to become an indispensable tool in the work of the department's power system planning committee and distribution system design committee, as well as an aid in the analysis of unusual operating conditions.



MEETING OUR RESPONSIBILITIES

D. D. Smalley*

Vice-president in charge of operation,
Pacific Gas and Electric Co.

IN analyzing some of the statistics of state research agencies, we find that population in California has increased 45.5% since 1940. The population of California at the end of 1947 was 10,050,000, and it is predicted that this trend of increase will continue and that at the end of 1950 this will increase to 10,550,000, all to be served with electricity in various ways.

The same reports show that during 1946, 105,000 homes were completed in the state, and that during the year 1947, 160,000 more homes were ready for occupancy. Although the data available are not quite as complete, we find that in the twelve San Francisco Bay counties and in Los Angeles County there have been added 4,233 new plants which, including some plant expansion, involve a capital expenditure of $725,000,000. When we add to that the hundreds of factories in smaller communities the capital investment will easily reach or exceed $1,000,000,000. They all need our service.

Agriculture has long been recognized as the basic industry in California and the one which in large measure is responsible for the prosperity of the state, and we are told that the total volume of all crops produced during 1947 was 2% above those grown in 1946, whereas the national annual average for 1947 was 5% less than 1946.

Mining operations fell off during the war, and it is interesting to find that the production of all mineral products amounted to $750,000,000 in 1947, an increase of 33% above the year 1946. Crude oil production was up 5% over 1946. At the end of 1947 there were 270,231 licensed commercial businesses in California, which was a gain of 18,000 over 1946 and a gain of 65,000 over 1941. We have done well in the realm of finances, for the total liquid assets of California rose from $5.019,000,000 in 1940 to $18,174,000,000 in 1947, an increase of 282%.

These data are mentioned simply to accentuate and emphasize the added responsibilities we have had to assume since prewar days.

The Federal Power Commission recently reported that the peak demand for the nation was 39.4 million kilowatts in 1944 whereas in April 1948, the demand was 46 million kilowatts, a 17% national increase. The reports of the Pacific Southwest Power Interchange Committee show that the coincident peak for this region in 1944 was 3,709,000 kw. and in 1948 to date was 4,604,000 kw., an increase of 23.1%. The load trends from 1944 to date are shown graphically on an accompanying chart.

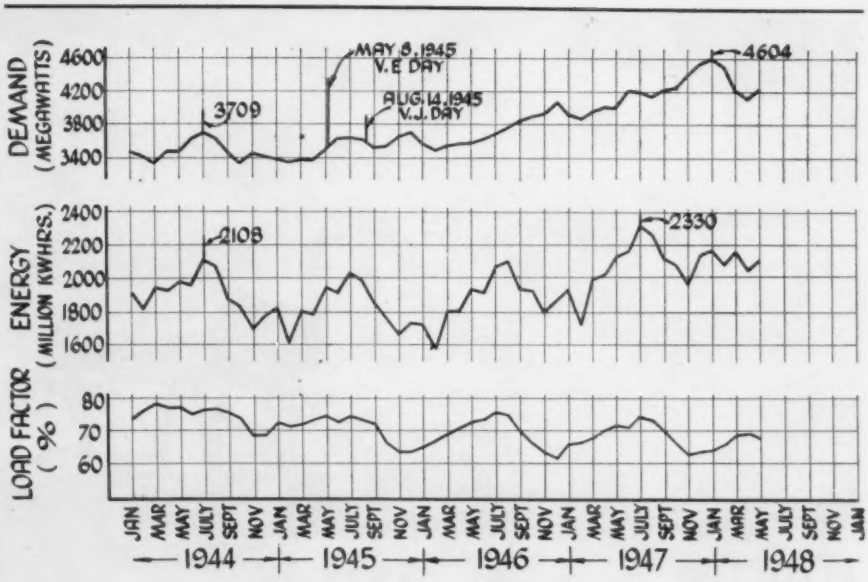
VE Day and VJ Day are marked on the chart and you will see that there was some recession of load immediately following VJ Day, but the recovery was rapid. It was predicted that load factors would probably drop below prewar levels. They were, of course, abnormally high during the war period when industry was operating on a 24-hour day, 7-day week basis, but we were amazed to find postwar load factors considerably higher than prewar factors. Note that the peak demand during the war period was 3,708,900 kw., occurring in July 1944. The energy delivered during that month was 2,108,400,000 kwh., which results in a load factor of 65%. This demand was again reached in August 1946, when the peak was 3,771,400 kw. with an energy delivery of 2,102,200,000 kwh., with a resultant load factor of 74.9%. We have no record of any peak as low as the one registered for 1946 since that date, but have had a progressive trend of increase since then to the demand in January 1948, of 4,603,700 kw. with an energy delivery of 2,186,200,000 kwh., which results in a load factor for that month of 63.8%.

In planning to supply the demands of increased load, we have had a number of disappointments. Immediately after VJ Day orders for generating equipment were placed or re-established by utilities throughout the country, thereby flooding the factories with work so that deliveries were extended far beyond normal shipping dates. We found that it was going to take over three years to receive and install steam turbine generators. Large substation transformer deliveries moved out to 2½ years. Distribution transformers, insulators, conductor material, hardware, and all miscellaneous items were hard to get. This, of course, imposed unprecedented problems for those who are responsible for the necessary organization to serve new extensions and new loads.

Experienced manpower was equally short and extensive training programs were carried on in order to build up crews and technical personnel to have them ready as material was made available.

As late as 1946 the Bureau of Reclamation representatives testified before the Senate Committee to the effect that within the succeeding 12 months there would be 150,000 kw. of new capacity available at Shasta and Keswick and that within 18 months there would be still another 150,000 kw. available. If one of these 75,000-kw. units had been installed in May 1947, as scheduled, it would have generated more than 142,000,000 kwh. from water which was wasted through the dam. This energy would have increased the carry-over storage in northern California by a like amount for use early in 1948. All of this energy could have been delivered over the existing transmission lines. Instead of receiving the output of the third generator in May 1947, it was finally put into service in April 1948, and the fourth unit is now scheduled for operation about July 1, 1948. The last 75,000-kw. unit at Shasta should be ready for service late this year and the three units at Keswick, totaling 75,000 kw., will be ready in the summer or fall of 1949. In January of this year there were 600,000 acre-ft. more water in storage in Shasta Dam than during January 1947, but the Reclamation Bureau felt that it was inadvisable to release any of that extra water to produce power to help supply the excess agricultural load imposed on us at that time, and this reservoir has not only filled but during the months of April and May it was necessary to spill water, which if it had been converted to electric energy would have produced about 220,000,000 kwh.

* Abstract of an address before the Pacific Coast Electrical Assn., San Francisco, June 16, 1948.

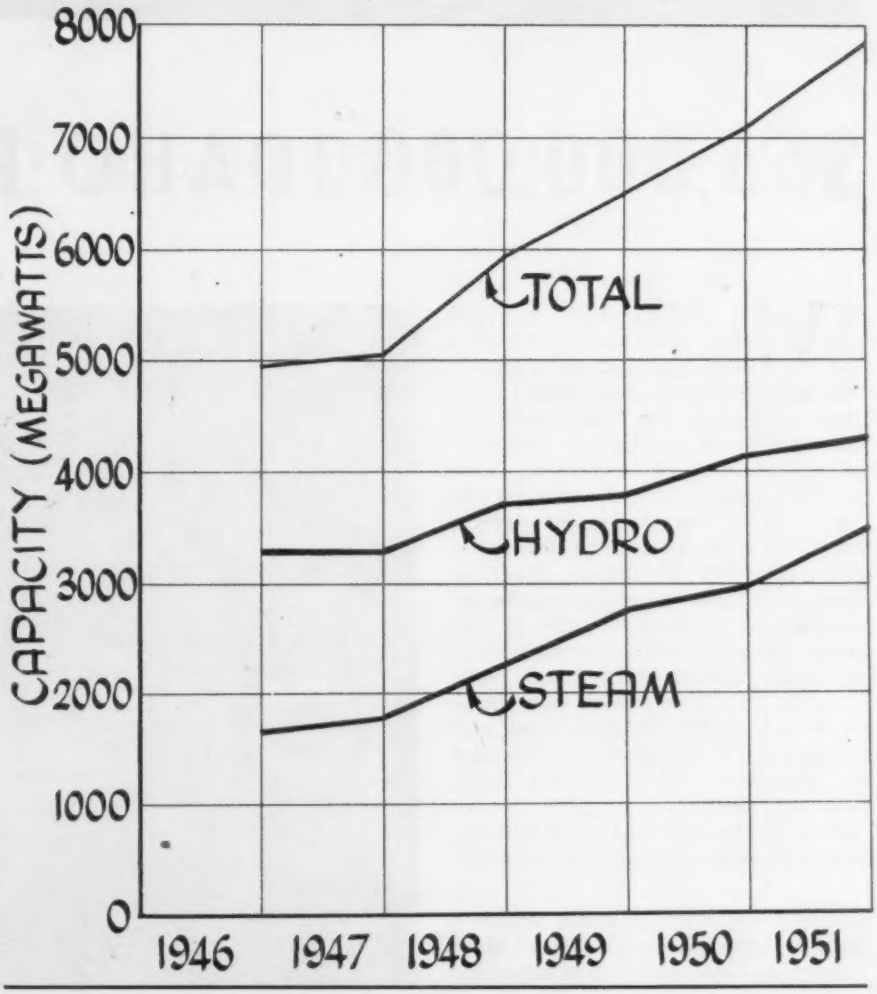


Kilowatt peaks by months, kilowatt-hours by months and the load factors for the Pacific Southwest Power Pool

What are the utilities doing to meet the trend of increases for the future? As I said before, it is necessary to plan at least three years ahead for the installation of generating equipment. All of the companies in the Southwest region have planned for the earliest possible installation. A chart shows the kilowatts of capacity available to the region in 1946, the additions made in both hydro and steam generating capacity in 1947, and the authorized and approved additions for subsequent years through 1951. This shows that in 1946 there was available to the region 3,285,000 kw. in hydro and 1,666,000 kw. of steam generation, or a total of 4,951,000 kw. In 1947, 117,000 kw. of steam was added, bringing the total available for that year to 5,068,000 kw. During 1948, 340,000 kw. of hydro and 472,000 of steam will be added, bringing the total available capacity to 5,880,000 kw. In 1949 it is proposed to add 162,000 kw. of hydro capacity and 470,000 kw. of steam generation, which will bring the total available to 6,512,000 kw. In 1950 plans call for the addition of 339,000 kw. of hydro generation and 260,000 kw. in steam plants, and the total available at the end of that year will be 7,111,000 kw. In the year 1951 hydro generation will be increased by 202,000 kw. and steam generation by 520,000 kw., so that the total generating capacity in the area at the end of 1951 will amount to 7,833,000 kw.

I want to call your attention particularly to the change in the relationship between hydro and steam generation. Whereas the steam generation in 1946 amounted to only 33.6% of the total, it increased to 35.2% in 1947, and to 38.3% in 1948, and will increase to 41.8% in 1949 and to 41.97% in 1950, and in 1951 steam generation with 3,505,000 kw. installed will amount to 44.7% of the total, with hydro making up the difference. This reduction in the predominance of hydro and the large increase in steam generation introduces a fuel problem, which is most serious these days. Figures for the entire Southwest region are not readily available although some estimates have been made. We do find that on the Pacific Gas and Electric Co.'s system alone, it is expected that if the year 1952 is dry, thereby requiring high load factor steam operation, this company will need the equivalent of 24,700,000 barrels of fuel oil.

The addition to production facilities in the Pacific Southwest region in the period covered by the chart amounts to 2,882,000 kw., or slightly over 58%, whereas the national average for increases in electric production is 35%. This indicates that the utilities in this region are doing something to meet the situation. It is a tremendous program without precedent in the area.



Capacity growth for the Pacific Southwest Power Pool, 1946 through 1951, which emphasizes changing relationship between installed steam and hydro generating equipment in this region

$55,000,000 IDAHO POWER CO.

WITH 142,500 kw. of hydro under construction Idaho Power Co. has in progress the largest power development program of any of the Northwest's private utilities. A small plant known as upper Malad, just completed, adds 7,200 kw. to this figure, making the total 149,700 kw. In round figures, 150,000 kw. Most recent project is the Bliss plant on the Snake River at Bliss, Idaho, just being started. An accompanying view shows site of this plant. Three 23,000-kw. units operating under a head of 74 ft. are to be installed. It will be a 64% load factor plant costing $12,500,000. First unit is scheduled for October 1949; second for December 1949, and the third, February 1950.

Next largest plant is lower Salmon, now well along. It will have four 15,-

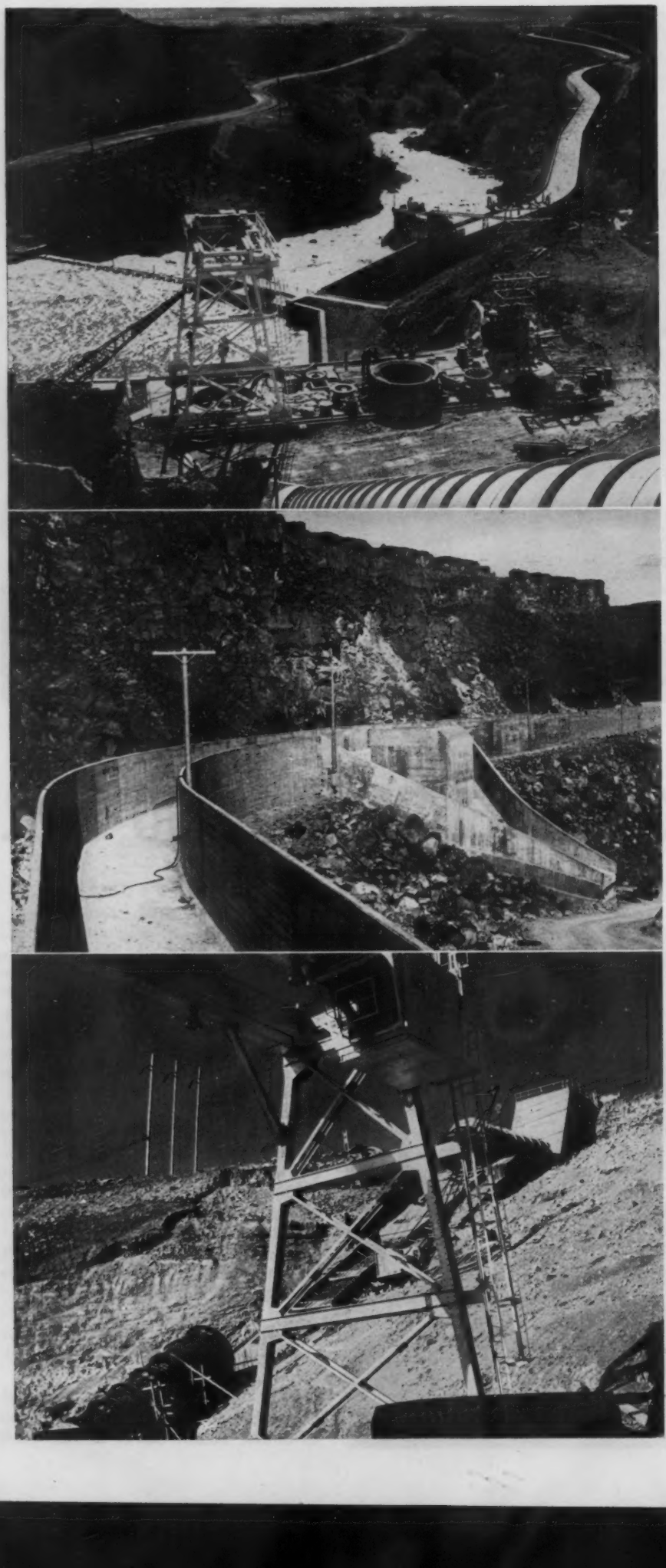
Outdoor construction saves structure costs on upper Salmon plants of Idaho Power Co. Operation is fully automatic

PROGRAM TO DEVELOP 150,000 KW.

000-kw. units operating at 54% load factor with head of 53-62 ft. Two machines are scheduled for April and May 1949, and two for November and December 1949. Cost of this project will be $9,400,000. It is located at lower Salmon Falls on the Snake not far from Glenns Ferry, Idaho. A short distance upstream are two smaller plants known as upper Salmon 1 and 2, now operating. No. 2 plant has two 9,000-kw. machines placed in operation in 1937. The No. 1 plant has two 8,250-kw. units put in operation in the fall of 1947. Both are 100% load factor plants.

Upper Malad plant with one 7,200-kw. unit, as mentioned, was placed in operation in May of this year. Lower Malad will have a 13,500-kw. unit to go on the line in September of this year. These plants represent an invest-

Site of Bliss plant (above). Dam site is just below ravine on opposite bank of Snake. Below: Lower Salmon plant



ment of $3,800,000. Both are 100% load factor plants. They are located on a most interesting river, the Malad, which flows into the Snake not far below the lower Salmon plant. The river, only 2¼ miles long, is fed by springs from the canyon walls. There is practically no variation the year around in the flow of some 3,000 sec. ft. of the Malad. Water for upper Malad, diverted by a small dam, flows through a concrete flume of square section to give a head of 124 ft. Water for lower Malad plant, located at the junction of the Snake and the Malad rivers, is diverted from the tailrace of the upper plant and is conveyed by concrete flume of the same type as mentioned to the lower plant, providing an operating head of 154 ft.

Accompanying photographs show views of these Malad plants and the two upper Salmon plants. The four plants have interesting features in common. The outdoor type of construction used effected material economies in building costs. Generators are completely housed, as shown, with gantry crane for installation and maintenance of equipment. All of the plants are semi-automatic with supervisory control to be centered at the larger and attended present lower Salmon plant.

Present transmission from the area in which all of the plants mentioned are located is at 138 kv. To provide needed additional transmission facilities for the new capacity still to come in, a 230-kv. liñe will be built across the state of Idaho from Pocatello on the east to Boise on the west, tapping to the new hydro plants enroute. Initial 230-kv. operation will be east from lower Salmon to Pocatello, primarily to provide ample facilities for serving two 15,000-kw. electric furnaces at a new phosphate plant now under construction at Pocatello. New mining loads are developing at Stibnite in northern Idaho. A 2,000-kva. electric furnace is now being installed for reduction of antimony. Such loads along with general load increases throughout the territory of the Idaho Power Co. have led the company to embark upon a $55,000,000 expansion program to be completed in the mid fifties. T. E. Roach, president of Idaho Power, reports very favorable reception to financing of this huge construction program because of the very favorable position of his company.

Upper and lower Malad River plants respectively. Center shows concrete flume and spillway for upper plant. These plants are also of outdoor type; will operate at 100% load factor from unvarying flow of spring-fed Malad River. Upper plant is now completed. Combined capacity of two is 20,700 kw.

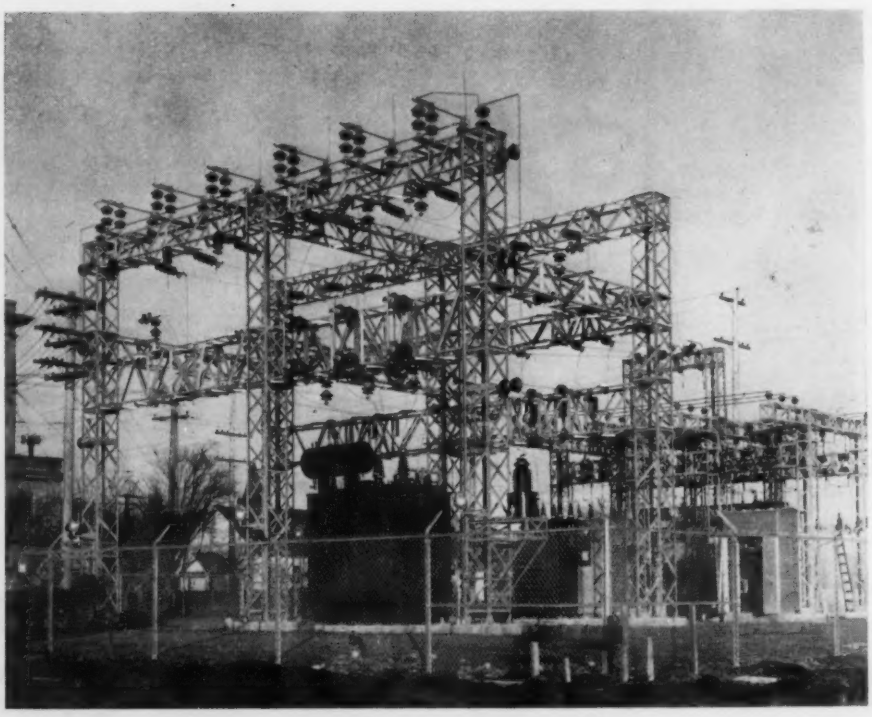
NEW TYPE HYDRO VALVE

New to hydro power service in the West is this Rotovalve, which is used as a turbine shut-off valve. Its rotating conical plug has a cylindrical passage which lines up with the connecting pipes when the valve is open, much like the spigot in a vinegar barrel. In operation it offers an unobstructed passage the same diameter as the pipe through which the water flows. Friction losses are therefore much lower than with other types of valves used for this service. To close the line completely, the plug is rotated 90 degrees by an offset hydraulic piston (top) and a mechanical linkage. Pressure on both sides of the valve is equalized by a bypass before the valve is opened. Two of these units are being installed in 36-in. lines to one of the 33,000-kva. units in Pacific Gas and Electric's new Electra hydro plant. Three more are being manufactured by S. Morgan Smith for installation on 54-in. lines at Southern California Edison's Big Creek 3 plant.

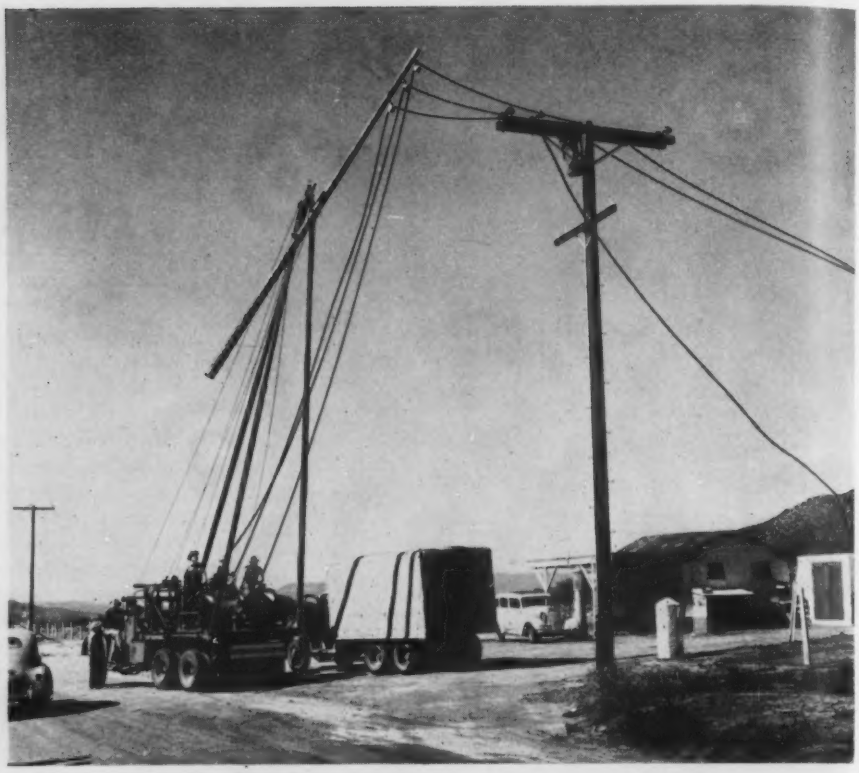
Fraser Valley Electrification

Uses Assembled Unit Substations

Six new substations of the type shown are being installed by the B. C. Electric Railway Co., in its lower Fraser Valley program. Load growth in this rich agricultural region has been so great as to necessitate complete rebuilding of facilities. Initial installation at the substation shown comprises a 3-phase, 3,000-kva. transformer, with separate step regulator. Transformer rating can be increased to 3,750 kva. with forced cooling. Primary supply is either of two 34-kv. lines which ultimately will become 60 kv. Motor-operated disconnects will transfer from one circuit to the other in event of line fault. Two outgoing 12-kv. feeders serve the 6,900/12,000-volt, 4-wire distribution system. Provision is made for a second similar 3,000-kva. transformer, step regulator and two more 12-kv. feeders. Initial cost was $90,000, or $30 per kva. Two of the six substations in the program have already been completed by the company.



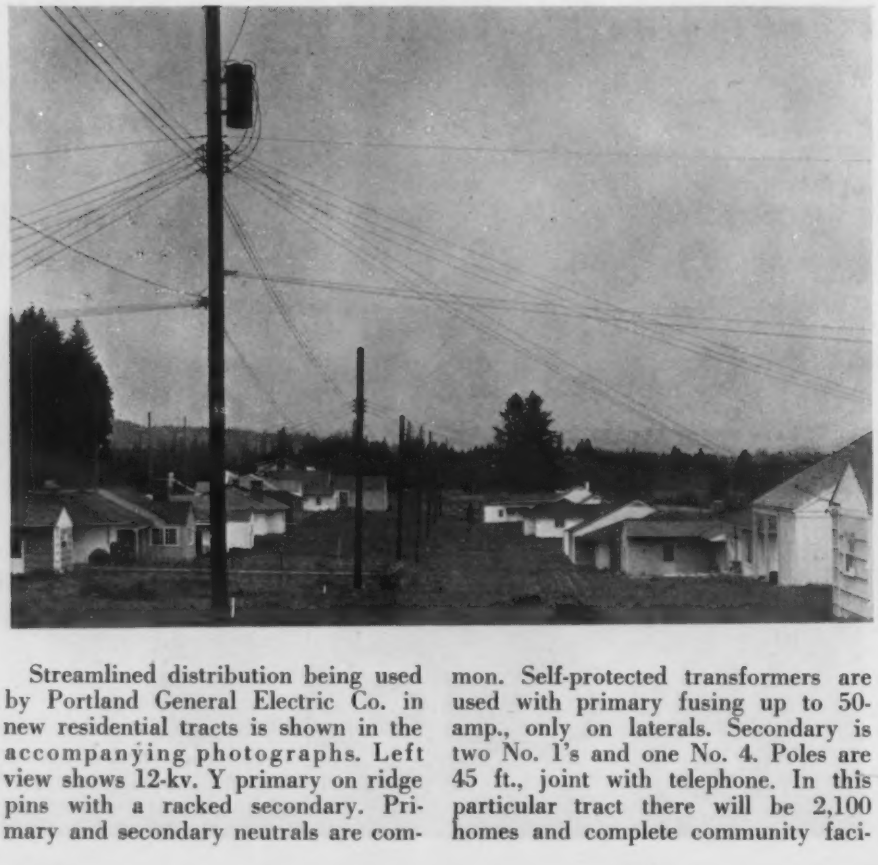
Pole-Top Stringing



Extension of rural distribution lines of the San Diego Gas and Electric Co. has been speeded by this method of stringing conductors. A 20-ft. service pole with three snatch blocks secured to its upper end is lashed to the boom on a boom truck. Three conductors are passed from reels on the truck through the blocks and attached to the first pole in the line to be strung. The truck then drives along the line, stringing the conductors from pole top to pole top.

Although designed primarily for use in wooded area, the method has saved up to half the time required for stringing where the truck can follow along the line.

NEW 12-KV. DISTRIBUTION



Streamlined distribution being used by Portland General Electric Co. in new residential tracts is shown in the accompanying photographs. Left view shows 12-kv. Y primary on ridge pins with a racked secondary. Primary and secondary neutrals are common. Self-protected transformers are used with primary fusing up to 50-amp., only on laterals. Secondary is two No. 1's and one No. 4. Poles are 45 ft., joint with telephone. In this particular tract there will be 2,100 homes and complete community facilities. Distribution was designed for maximum demand of 5.4 kw. per customer. Right view shows type of 4,150-volt urban distribution used in Portland designed for cut over to 12 kv. later. PGE is thus following trend toward primary distribution at 12 kv.

PUSH BUTTONS CAUSE BLOW-UP

IF inspectors did not blow a fuse, they certainly generated plenty of heat over push-button type of wiring. Two recent chapter meetings of the International Association of Electrical Inspectors flared up into white heat when low-voltage control for lighting in residences came up for discussion. After a release of the charge, however, the situation is settling down to a more sensible viewpoint regarding this newest idea in electrical convenience.

Oddly enough the idea is not new. Sechrist Electric in Denver many years ago pioneered a relay system for the control of lighting circuits through low-voltage push-button operation. Although many installations were made and some are still operating, the idea lost ground for many years because of failure of relays.

Sensing the possibilities from the extensive use of relays to control all manner of electrical operations in a bomber made in the aircraft industry, A. B. Smedley spoke and wrote about the idea for ELECTRICAL WEST some two years ago. The Fritz Burns postwar house in Los Angeles initiated the first new system employing relays which has now become known as Touch-Plate. Recently the Square D Co. has announced its Saflex system. (See ELECTRICAL WEST, January 1948, P. 66.) General Electric Co. has now brought forth a system of relays and a three-conductor wire with the same idea. Before long several other manufacturers will be on the market with similar equipment.

It was the actual introduction of Touch-Plate and Saflex systems which sparked the inspector reaction. From the discussion at a joint meeting of three chapters of the inspectors association at Modesto, it could be seen that many inspectors feared dire consequences from the introduction of this system.

Briefly their fears centered around these points:

1. Fear that this system would bring about the introduction of haywire and bellcord type of wiring which would degrade the publics' respect for a wiring installation.

2. Fear that, should a relay fail, the householder might remove it and cut the small relay wires into the 110-volt circuit for control of the lights.

3. Fear that relays would give trouble and cause other complaints from the public.

4. Fear that the system would mean less work for electricians because of the ease of installing the low-voltage wiring.

In Fresno the electrical department had an ordinance passed May 15 in order to control installation methods on this type of wiring.

L. B. Sterling, chief inspector of Fresno, presented it also to the Modesto meeting and recommended that other cities pass similar ordinances. His contention was that the system would soon be used for control of motor circuits, heaters and other types of installation, even though it has been introduced in residential wiring now as a means of controlling lights from many places. He also explained that the reason for the ordinance was to clarify the question of whether such installation, being of a low-voltage type, came within the scope of the inspection department.

In Long Beach at the Southern California Chapter meeting, May 26, a committee headed by A. C. Veit, Los Angeles County electrical inspector, made a report on the system and submitted some recommendations for such types of installation. These were very hotly debated. Changes were made from their original form and the final outcome was the set of recommendations which are printed at the bottom of this page.

These recommendations differ only slightly from the provisions of the Fresno ordinance. The Fresno ordinance takes many of the provisions in slightly different language but has the same purpose. In addition to the recommendations shown on this page, the Fresno ordinance also requires

Requirements for low-voltage control circuits acceptable to members of the Southern California Chapter IAEI at May 26 meeting

1. Wiring to be installed in same manner as non-metallic wiring systems as per Sections 7-502 and 7-507 of Electrical Safety Orders of the Division of Industrial Safety, state of California, and Article 725 of the National Electrical Code.

2. The wires shall be secured every 4½ ft. with an approved device.

3. Wires to be of an approved type with 300-volt insulation and a minimum size of No. 18.

4. Fixed wiring shall not be installed where it is exposed to mechanical injury.

5. In figuring the size of boxes required, each relay shall be figured as requiring a minimum of 3 cu. in. in addition to size needed for the number of wires in the box. If the relay is larger than 3 cu. in., the size of the box is to be increased accordingly.

6. Low-voltage switches used to operate the relays shall be of an approved type and shall be secured to a plaster ring, outlet box or other approved means.

7. The relay is to be adequately fastened to the outlet box in which it is installed and in such a manner that it may be removed readily and reinstalled after the outlet box containing same is concealed, without removing plaster on the finish of the building.

8. If desired, relays may be grouped any place in the attic space where there is a minimum vertical clearance of 2 ft.

9. The transformer and secondary fuses shall be located with the service equipment or in a readily accessible location.

10. Secondary side of transformer to be fused according to size wire used in control circuits unless transformers have inherent current-limiting characteristics. (See Sections 7281 and 7282 National Electrical Code.)

11. In commercial and industrial buildings, where the secondary circuit exceeds 25 volts or 50 watts, the system shall be installed in accordance with the Electrical Safety Orders of the Division of Industrial Safety, state of California.

12. It is recommended that a means of identifying the wires be used.

that all low-voltage wiring shall be separated by an approved barrier from circuit wires, and that the relay switch shall be approved only on circuits not exceeding 150 volts to ground.

The paragraph relating to installation goes into detail rather than taking the wording in the National Electrical Code. Likewise it makes no provisions for accepting transformers which have inherent current-limiting characteristics, but requires that the secondary side shall have over-current protection. In many cases this would be excessive and ineffective since the characteristics of the transformers would eliminate any possibility of danger from fire or breakdown.

Both the Fresno ordinance and the recommendations of the Southern California Chapter call for No. 18 gage rubber-covered wire of not less than 300-volt insulation. The purpose of this requirement in both cases is to rule out the use of cotton braid and wax-dipped electric bell wire for these control circuits. However the new wire brought out by General Electric Co. with its relay is a No. 22 conductor in a plastic covering and cast in a braid of three wires which makes a neat tape. Insulation for this is not of the 300-volt type and would not seem to be necessary at the voltages the system is likely to employ.

It has been suggested, rather than to set up by ordinance the size of wire and the insulation, that the matter be referred to Underwriters' Laboratories for the establishment of standards and the approval of wires suitable for the purpose.

Much of the reaction of inspectors can be charged off to resistance to anything new. Likewise when they battle against misuse of cords and daily find examples of misapplication of wiring, they cannot be blamed for supercaution in regard to this innovation. However the system has so many advantages from a convenience standpoint, that it seems likely to grow despite these reactions. The situation should be clarified in the next edition of the National Electrical Code in order not to complicate local ordinances with more special rules of this type.

As for these systems reducing the amount of work of electricians, that seems to have as much sense to it as the fears originally expressed for loss of revenue when tungsten filament lamps were introduced, or later when the fluorescent lamps came in to take the place of incandescent. No improvement in technique has so far meant any less work for the electrical industry. Always it has resulted in a greater market because of the greater service it performs.

Push-button wiring deserves a trial.

WHAT PRICES NOW?

WHAT will happen to prices now? Will the recent Supreme Court decision in the cement and salt cases and the FTC order in the conduit case cause a complete revision of price schedules throughout the country?

Opinions differ. Taken literally, as pointed out by Lowell B. Mason, Federal Trade commissioner, it would mean that the multiple basing point pricing system such as the cement manufacturers use, and the single basing point system as used by the conduit manufacturers would be out, as a matter of law. Freight absorption would be out and zone prices also. Mason also said the individual universal delivered price system would be out.

In a subsequent statement other commissioners of the Federal Trade Commission did not agree with Mason's views, but contended that the cement and conduit decisions were aimed only at these methods of pricing as means of creating a monopoly or of limiting competition.

Because of his experience in the pricing field as the publisher of pricing services, ELECTRICAL WEST asked A. H. Gudie, manager, Biddle Trade Bureau, Los Angeles, for his opinion as to the meaning of these decisions. Since the decisions will have far-reaching effects on appliances, wiring supplies and materials, apparatus, etc., it is important to everyone in the electrical industry.

"It is my present view," says Gudie, "that the only way an electrical manufacturer or wholesaler could be *sure* that he is living up to all of the new decisions would be to sell his merchandise f.o.b. his plant or warehouse with the same price to all purchasers regardless of quantity. Note that I said the 'only way he could be *sure* at the present time,' and obviously this is an extreme view and is beyond that which is intended by the courts or the Federal Trade Commission. At least it is beyond the situation which will eventually develop.

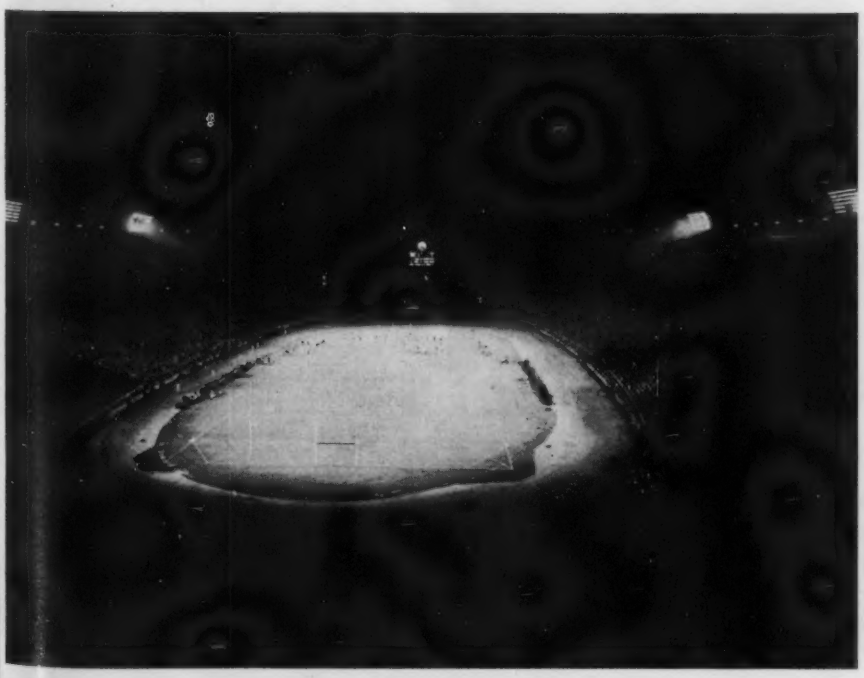
"The courts have not said that a seller cannot have quantity discount but they might just as well have said so, because I know of no accounting system which would prove the exact savings created by orders of various quantities. I say this is an extreme, beyond the probable eventual development, because it would require that we pay more for Wrigley's chewing gum on the West Coast than they pay for it in Chicago. I personally cannot forsee such a ridiculous situation as the final and settled result.

"In the cement case decision, a cement company filed a brief with the Supreme Court asking how they were to follow the court's decision without violating the Robinson-Patman Act at the same time. The court has since refused to entertain the brief simply by stating it would not review the decision. My personal view was that the court might have issued a statement to the effect that it was not in its province to answer such questions and if there was a conflict between its decision and some other laws the remedy was up to Congress. Although the court did not come out with any such pronouncement, the effect is the same and we will undoubtedly see some congressional activity along this line in the future.

"These decisions affect not only the conduit manufacturers who sell on a single basing point system or the cement manufacturers who had multiple basing points, but also affects such people as the wire manufacturers, wiring device manufacturers, etc., who sell on a uniform delivered price all over the nation. Those manufacturers selling on a zone basis, such as many of the fittings manufacturers, are also affected because the meat of the situation is that the manufacturer is supposed to secure the same net prices at his factory regardless of the location of his customer. There is only one way in which this can be accomplished with any degree of practicability and that is to sell f.o.b. plant, with no freight allowance.

"If this should become common custom the economic repercussions would be terrific and probably would result in much decentralization, the establishment of many small plants in various market areas, increased costs, due to the smaller scale of operation in each plant. It will also lessen competition as a plant in any given locality will have almost monopoly of business in that location as against present competition from plants in other localities."

Until many of these points are cleared up either by congressional action or the courts, it is thought that manufacturers will make no changes in present procedure. Gudie was of the opinion that developments will come rather slowly because changes of such magnitude simply cannot be made over night.



Colossal Lighting

A. H. Clarke

Crouse-Hinds Co.

"BEST-LIGHTED football stadium in the world" was the avowed objective of recent refloodlighting of the huge Los Angeles Coliseum. Original lighting of the 25-year-old stadium with its permanent seating capacity of 101,671 (largest in the U. S.) was with 84 1,500-watt floodlights installed in 1930. This installation was considered very satisfactory, and was equivalent to the best practice in night lighting developed at that time.

In contrast, the new lighting system as finally designed consists of 432 Crouse-Hinds Type LCE 1120 floodlights. Each uses a 1,500-watt (G) bulb concentrated filament, floodlight service lamp. These narrow-beam concentrating units confine the light to the playing field, giving a system which reduces to a minimum glare for either players or spectators.

All floodlights are concentrated on six towers, three on each side of the stadium. Each mounts 72 units 136 ft. above the field and 300 ft. back from the sidelines of the gridiron. Unusual design of the towers as shown in the accompanying illustration was necessary to insure that no floodlight would have its light partially blocked by floodlights on adjacent rows.

Location, focusing and adjustment of the units presented a special problem in the multi-purpose stadium. In the fall of the year it is used largely for football, and it is desirable to have the light concentrated on the football field. In spring it is used for track meets, rodeos, racing and a wide variety of other purposes requiring lighting of the entire track. Special indicating quadrants marked to show the separate adjustments are used to determine the desired setting of the individual units. Optimum distribution of light at all times is thus insured for this installation designed to accomplish the ultimate in modern lighting practice.

Top: One of six towers lighting the Los Angeles Coliseum. Three towers on each side of the field mount 72 1,500-watt narrow-beam concentrating units apiece. Bottom: Light can be concentrated on the football field as shown, or spread over the entire playing field for other big sporting events

Light On Myrtlewood

TO light an office is one thing but to illuminate what is probably the world's richest and most extensive display of rare Oregon myrtlewood paneling in a manner that is in keeping with its richness is another thing. Engineers George Pettingell and Grant Kelley and Electrical Contractor W. R. Grassle met this challenge for Architect Pietro Belluschi for the remodeled executive quarters of the United States National Bank at Portland, Ore. It was part of a general modernization of the bank building, from an electrical standpoint at least.

The executive offices are on the third floor. A large area is devoted to an open office space without partitions. The private offices and conference rooms are located adjacent to this main office space. Along another corridor the note department opens on the same floor.

Oregon myrtle, a hardwood growing in a narrow Pacific Coast region, was shipped to Pennsylvania, sliced into 1/28-inch sheets and fabricated into panels by Grand Rapids Equipment Co. for the interior finish. Its color is a warm golden tone. Draperies of cerise orange hue, carpeting of soft green, all furniture finished in myrtlewood with orange leather upholstered chairs, made up the color scheme. To light this inconspicuously without calling attention to lighting fixtures required built-in ceiling troffers in the acoustical finished tile ceiling of light tan color.

To provide illumination on the ceiling itself, Hub two-lamp fluorescent fixtures of a recessed flush type with Holoflux lens were used. They are run in continuous rows as illustrated.

Besides the lighting the remodeling involved installation of reverse-cycle refrigeration and cooling designed by J. D. Kroeker, mechanical engineer. A Turbo-vac 150-hp. unit has been installed in the basement. Heat is drawn from well water from a well under the sidewalk.

Recessed fixtures fit the straight lines of the columns and desks, give illumination to the light-colored ceiling and the figured patterns of the myrtlewood panels. Lower picture is the conference room in Flexwood oak, the fixtures on short stems crosswise of the long table

Electrical modernization required installation of a new vault on Oak St. The adjacent Porter Building was purchased and its service and that to the bank were combined. A bus was run to the existing bank from the Porter Building and the entire load put under one meter. The 200-amp. bus was run through the boiler room to the new switchboard location. A steam-driven 550-volt d-c machine was removed. The building still uses 550-volt on elevators, obtained from the trolley lines but ultimately will replace these with its own m.g. sets.

The second floor offices were also being remodeled and in them surface-mounted fluorescent units installed for lighting.

Lighting Contest

The new official rules for the $1,500 Planned Lighting Merit Award Competition sponsored by the Third International Lighting Exposition have been released for publication. There will be five separate competitions, one for each of the following groups: (1) electrical contractors; (2) utility light- and power representatives; (3) architects and consulting engineers; (4) electrical wholesalers, owners, lighting specialists and salesmen; (5) industrial and commercial owners and users of lighting.

All entries are to be limited to the planned lighting solution of a single lighting problem. Competition closes Jan. 15, 1949. Awards will be conferred at the opening conference session of the Exposition on March 29, 1949. Requests for application blanks and copies of the official rules booklets should be addressed to Merit Award Committee, 326 West Madison St., Chicago 6, Ill.

Rubber Panel Heat

For panel heating the long-heralded U. S. Rubber Co. Uskon panels, made up of insulation and conductive rubber, have been placed on the market through Graybar Western houses. The panels come in either 4x4- or 3x4-ft. sizes and at densities of either 17 watts or 22 watts per sq. ft. Conductive rubber is sealed between layers of phenolic impregnated insulation with asbestos board and aluminum foil heat insulation above to direct the radiation downward. Laminated boards are approximately ¼-in. thick and have the same appearance as standard wall boards. Panels operate at 220 volts; heat output from a 17-watt panel is 58 B.t.u. per sq. ft., and 75 B.t.u. for the 22-watt panels. Power consumption of the 4x4 panel is 272 watts at 17 watts per sq. ft. and 352 watts at 22 watts. Panels list from $25.20 to $28.

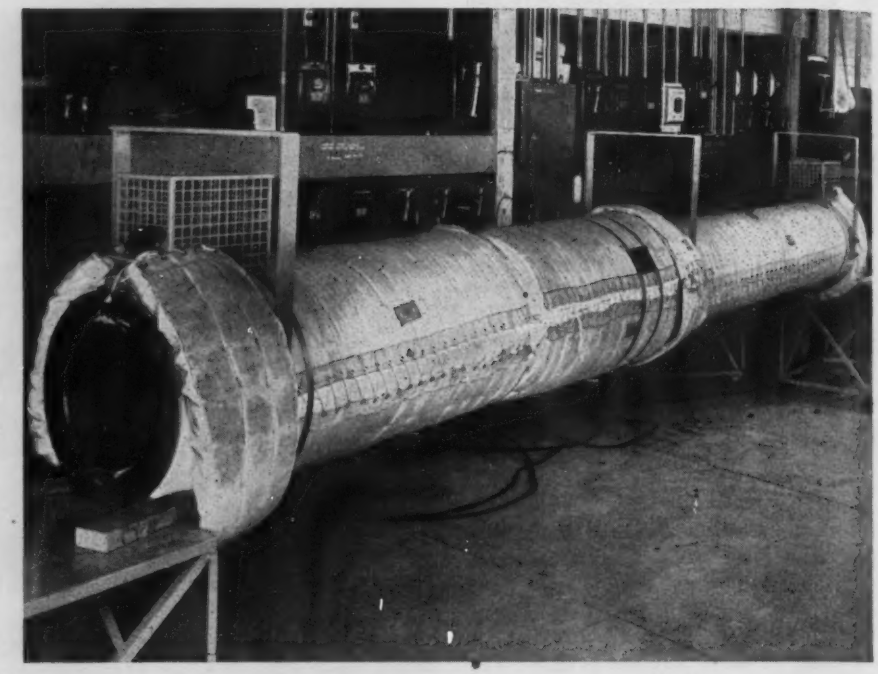
Adequate wiring moves on both in the Rockies and the Far West. In Stockton 185 homes in Swain Oaks Manor development are being adequately wired and advertised as such by job cards and by a large illuminated signboard. Developers Peter L. Sala, architect, and Dante J. Nomellini, builder, are being presented with certificates by Ray Flint, then manager, Northern California Electrical Bureau. Harry McMasters, Pacific Gas and Electric, worked with the builders. Below: Even the top men of the country on A-W, Pat McCaughey and O. C. Small, of National Adequate Wiring Bureau, in New York, participated in presenting the first certificate in Denver under the revitalized A-W program. In the picture are McCaughey, Les Hayworth, Southern Colorado Power Co., Pueblo; Small; Ralph Hubbard, manager, Rocky Mountain Electrical League; Mrs. and Mr. John L. Lane, owner of the house; Ted Foulk, Public Service Co. of Colorado, A-W chairman for the league; Meryl Metzner, league A-W field representative and F. H. Salfisberg, Cheyenne Light, Fuel & Power Company

● GRADE SCHOOL students can now be given authorized instruction on light and sight and use of lighting fixtures and lamps for more adequate sight protection through a program just released by Better Light-Better Sight Bureau in cooperation with the research division of National Education Assn. Intended for fifth and sixth grades, twelve charts, leaflets, quiz sheets and a teacher's guide are provided for a series of three lessons. Plan books for both utility representatives and school administrators give necessary information for initiating the program. Material is available from the bureau at 420 Lexington Ave., New York.

SUPER SPACE HEATER

Unprecedented for size, the 800-kw. space heater shown was made for heating air at the new supersonic wind tunnel at Moffett Field, Calif. Requirements called for heating a large volume of air at high temperature and high velocity. The heater measures 16 ft. long by 16 in. in diameter, and is rated 800 kw., 600 volts d-c, 1,333 amp. Maximum exhaust temperature is 1,500° F, at maximum pressure of 57.5 psi. absolute, with a volume of air of 710 cu. ft. per minute. Design pressure is 300 psi. and working pressure, 60 psi. Inconel steel construction will minimize creeping at highest operating temperatures. The casing is insulated with a quartz Fiberglas material, with a maximum temperature rating of 2,000° F at the outlet end.

The heating element consists of 140 sections of 5.7-kw. double helical coils mounted on ceramic terminal blocks and designed for voltage of 150 volts, d-c. Individual elements are grouped into four sections and rated at 200 kw. each. The four sections are then connected in series to operate on 600 volts, d-c.



The immense heater, built by the Wesix Electric Heating Co., is to be used at the new NACA supersonic wind tunnel at Moffett Field. It will provide an extremely sensitive and controllable source of heat for simulating jet engine exhausts in the wind tunnel.

Comparative Heating Costs

Fuel	Unit	Price per Unit	B.t.u. per Unit Ash & Moisture Free	% Waste Ash & Moisture	Efficiency %	Required *	Total Cost	Index Coal	Index Oil
Residential									
Coal (stoker)	Ton	$15.97	13,500/lb.	15	45	9.68	$154.59	100	83
Oil (No. 3)	Gal.	14.37c	140,000	0	55	1,299	186.67	121	100
Stoker fuel (sawdust)	Ton	$12.31	8,500/lb.	0	50	11.76	144.77	94	78
Sawdust	Cord	$ 5.15	14,300,000	20	45	19.42	100.01	65	54
Gas (450 B.t.u.)	Therm	17c	100,000	0	65	1,538	261.46	169	140
Elec. resistance	Kwh.	1.05c	3,413	0	95	30,842	323.84	210	173
Elec. heat pump (well)	Kwh.	1.00c	3,413	0	333	9,800	98.00	63	52
Elec. heat pump (city water)	Kwh.	1.00c	3,413	0	333	9,800	98.00	122	101
	C Cu. Ft.	7c				1,286	90.00		
Coal (hand fired)	Ton	$17.51	13,500	10	35	11.76	205.92	133	110
Commercial									
Coal (stoker)	Ton	$13.80	13,500/lb.	15	60	7.26	100.19	100	90
Oil (386)	Bbl.	$ 4.54	6,300,000	0	65	24.42	110.87	111	100
Oil (No. 3)	Gal.	14.37c	140,000	0	65	1099.	157.93	158	142
Steam	Mlbs.	$ 1.10	1,000,000	0	95	105	115.50	115	104

$$*\text{Units} = \frac{100{,}000{,}000}{\text{Fur. Eff.} \times \text{B.t.u. Unit} \times \frac{(100 - \%\ \text{Waste})}{100}}$$

Fuel required for 100,000,000-B.t.u. heating. Table prepared by A. D. Snedden and G. H. Pike of Portland General Electric Co. for use in comparing heating costs for fuel only with the several methods of heating residences and commercial buildings now employed in the Portland area. The heat pump shows lowest over-all cost in the study

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ELECTRICAL WEST

Sales Guide

News Letter

FOR THE ELECTRICAL MERCHANT OF THE WEST

July 1948

Lots of news is ungood at the moment, but it's better to know it and face it than to hide in the sand. Good salesmen are resiliant, they have plenty of bounce. And the West is still the best market in America if you can get appliances to sell to it and if you sell the benefits over the rising costs. The fall looks rugged for merchandise deliveries. Prices are still on the rise too. Can't increase pay in all industries without putting pressure under prices. The ERP and the renewed defense program may put much wanted steel under allotment again. That means less refrigerators, ranges, all steel products. Aluminum too is going back into planes. So set your business sails for rough weather this fall and winter.

"Leave us face it"

Another round of wage boosts in the building game July 1 will discourage new home building, already out of reach of the salaried class. Costs of wiring in ranges and dryers bound to increase again. High costs are strangling adequacy in new home wiring, to make future applaince sales difficult.

Up she goes

Even slashed prices haven't moved radios very much lately, dealers report. A return of that old "summer slump" in radio, familiar before the war? Record business is in the dumps too. Could be the lack of so much loose change in people's pockets, the HCL being what it is.

And down

Defense program may draw off radio components, though, and make radio sets a bit on the scarce side by Christmas if Russians keep being ornery about Berlin. That's how far-away events reach way down to your home town now.

Shadows cast

Good news (to shift gears now from reverse into forward) is that electric ironers are almost to that breaking point of acceptance that means they are "in." Ironer sales have shown steady improvement; are much better than prewar. With laundry prices reflecting wage boosts, there is opportunity to sell ironers as a real money saver.

Ironers are "in"

Bendix news release says introduction of new models and lower prices has increased dealer sales 150%. That's not the way we hear it, but perhaps it is so in many aggressive stores. Prices of all automatics have hit resistance, and even wringer models are not moving. Time to begin selling washers and ironers as a means of saving in the family budget instead of a luxury.

Washers slow

Thor, hitherto not fully automatic but having price adventage because its washer doubles as a dishwasher, is now bringing out an attachment to time the cycles. Makes a good follow-up item with a customer. Another bit of news--Thor, as agent for Lustron all-steel houses, will have one erected at its El Monte, Calif. plant soon. Will contain sink unit.

Timer now

Zenith and Farnsworth have come to an agreement on use of television patents held by the latter and Zenith plans to make headway with both its regular television and its "phono-vision" system for customer-paid television service in collaboration with the telephone companies. Telephone company would tune in and meter missing links in telecast to complete pictures. | Wired video

Columbia Records has told of new long-playing Vinylite records, longer life and lower cost, with more grooves per inch so that a full symphony can go on two sides instead of six. Phonograph pickups would have to be changed for new grooving. | Plastic platters

Hint if you sell wire recorders. Some chain stores and utilities now use them in taking inventory, talking the items and quantities onto the wire to be taken off later by stenos. Might be something you could sell to others in your town who have similar jobs to do. | Talk inventory

Several important changes at Western Merchandise Mart, San Francisco, in preparation for Summer Market, Aug. 2-7. For the first time since the war there will be no government agencies in the building; the last one left June 28. Space has been made available to many waiting. Others are shifting to different locations. | Market readying

Frigidaire will move its Pacific Regional Headquarters from the fifth floor to the fourth--401, near the elevators, in space formerly had by Edward F. Hale Co. Is using the fancy Hale fixture work, only painting it in light colors so the place looks cheery instead of night club. W. I. Buchanan makes his headquarters there. | Moves down

LeRoy H. Bennett Co., Monarch distributor, moves into the Frigidaire spot 500 on fifth floor. Sues. Young & Brown open in Northern California with space 558 and with Jack Baker as San Francisco manager. Handle MGM records, Coolerator, refrigerators, One Minute washers, Lewyt cleaners, Proctor, Westclox, Seth Thomas clocks. Another distributor, Pacific Wholesale Co., (a subsidiary of California Casket Co.), opens a showroom at the Mart too. Will have space 558-C to display Gilfillan radios, Dexter washers. Also Wholesale Radio & Electric Supply Co., known as WRESCO, of which A. Raport is general manager, will have space 444, showing Olympic radio and television, Cinderella washer, Sampson United appliances. | Others

Factory representatives and offices added will include: Horton Manufacturing Co., with district office and showroom under Paul H. McConnell, district manager. Horton recently announced a straight-to-dealer policy, not through jobbers, and this will be Western headquarters. Emerson Radio of Calif. will be in space 471-A, which will be offices of Charles O. N. Wasser, president of the California company. Fred S. Campbell Co., representing U. S. Television Corp., will be in space 446. Lee Arter Co., formerly only in housewares, will be factory representative for Gill Electric stoves of Redlands, Rittenhouse chimes, Master Appliance Mfg. Co. and Kisco fans. Whit Alger will be the San Francisco manager. | Still more

Lloyd Sutton has associated with him Curtice Clark, public relations man, in Sutton & Clark, handling the Colonial Vision-Master television set with the 9x7 ft. screen for Northern California and Nevada. Also the Freed Eisemann radio-phono. | Big screen

Norge automatic washer had its debut in St. Louis recently. Big selling feature is its capacity—holds more than 18 pounds of laundry at one time. | Big load

Ralph W. Christie, former Thompson-Holmes and Raycraft, is now sales manager for major appliances and radio at J. N. Ceazan Co., northern California division, San Francisco. Bill Miles, recently with the now defunct Majectic radio, and a good man, now is merchandise manager for the Capehart, and Farnsworth division which Ceazan distributes exclusively in northern California, as well as Toastmaster water heaters, Tracy sinks and Whiting freezers.

Change

Appliance and radio trade dinner on Wednesday evening, Aug. 4, will again be the big event of the market for the electrical industry. George L'Amoreaux, manager of promotion for the Mart, promises a program of top rate entertainment and big shot speakers. Frank M. Folsom, executive vice-president of RCA, from Camden, will tell of the merchandising aspects of television. Harold E. Jalass, v-p. and general sales manager of Cribben & Sexton Co., gas range makers, will be the other featured speaker.

Dinner program

San Diego Bureau of Radio & Electrical Appliances is busy planning its 11th Annual Electrical & Home Appliance Show scheduled for Sept. 14-19. Space is being reserved now. As last year, the show will be held in the Federal Bldg., Balboa Park. J. Clark Chamberlain, bureau secretary-manager is allocating space on fairest basis possible.

San Diego show

H. Gordon Smith is the new assistant district manager of General Electric appliance sales in the Pacific district, reports A. M. Sweeney, general sales manager of the company's appliance and merchandise department. Smith was formerly with G-E in Jacksonville, Fla., as local manager of appliance sales.

G-E Appointment

When its meetings resume in the fall the Association of Appliance Dealers in Seattle will follow a different plan: meetings will be more of a social nature with much of the association business being handled by committees; will include education and entertainment features; will be open to retailers, distributors, distributor salesmen and factory representatives. . . in the planning is a business management conference which will cover management angles of the appliance business and merchandising slants on appliances.

Lays new plans

Los Angeles County Fair at Pomona is scheduled for Sept. 17 to Oct. 3. Latest household, farm and industrial appliances will be displayed. Southern California Edison will participate with an exhibit all in miniatures.

At the fair

Universal announces these price reductions on three of its iron models- $7.95, $9.95, and $11.95.

Dropped

Contractors, architects, builders and engineers will be interested in Westinghouse's new 42-page guide called "Electric Heating for Homes." Booklet contains series of charts giving required heating capacity for given room; includes information on selection, location and installation of wall and floor model unit heaters. Sells at $2 and can be secured at any WESCO office or distributor of Westinghouse supplies.

Heating guide

Los Angeles branch of General Electric Appliances Inc. has installed a new display section in its service department. Result is a 50% increase on the sale of service parts, says S. B. Maher, manager.

Worth while

Western Merchandise Exhibitors 17th San Francisco Show, featuring lines of gifts, toys, lamps, jewelry, stationery, and housewares, will be August 1-5 in the San Francisco Civic Auditorium concurrent with Summer Market Week at the Western Merchandise Mart, August 2-7. Kay Leber is managing director of Western Merchandise Exhibitors' Assn.

Show in S. F.

July conference

The active San Diego Bureau of Radio & Electrical Appliances has a heavy day's program planned for its Annual Summer Conference to be held on July 13 at the U. S. Grant Hotel in San Diego. Preliminary program indicates important industry speakers at all three sessions. (See story, page 81).

Chicago meet

Fourth Leadership Conference of NERA is scheduled at the Hotel Sheraton, Chicago, July 11-13 during the time of the Chicago Summer Market. NERA president Herb Names of Denver will preside at all sessions of the conference.

West shines

Tide magazine in a recent Index of Consumer Buying Expectations reports that the best market segments continue to be found in the rural areas and in the West. Index gives figures on buying plans of families in all sections of the country on eight household items—ironers, ranges, irons, vacuum cleaners, electric mixers, refrigerators, washing machines and toasters.

Twin show

Westinghouse meetings to show its new 1948 Laundromat and twin automatic clothes dryer started in Los Angeles on June 17, with I. F. Brownison, manager of the company's laundry equipment division, Mansifeld, Ohio, and R. J. Sargent, on hand at all of the coast showings. After Los Angeles, meetings were held in San Diego on June 18, in San Francisco's Merchandise Mart on June 23, in Fresno on June 24, and in Sacramento on June 26. Because of flood conditions in the Northwest scheduled meetings for June in Portland and other areas were postponed until later in July.

Radio franchise

McCormack & Co., Western Merchandise Mart, San Francisco, has taken over the northern California distributorship for Motorola Inc. McCormack formerly had Majestic radios which recently went into bankruptcy.

Sales manager

Gordon Wright has been appointed sales manager of Kaemper-Barrett Inc., San Francisco, northern California and western Nevada distributors of Admiral radios, refrigerators and ranges. Wright was formerly national field sales manager of the home instrument department, RCA Victor Division, Radio Corp. of America.

Figures from farmers

"What's Being Bought in 1948," a survey issued by the Northwest Farm Trio publications of Spokane, listing probable electric appliance purchases of farmers in the Inland Empire during 1948, gives these interesting figures: Farms of the Inland Empire this year will buy 32,040 electric ranges; 26,182 electric refrigerators; 26,081 washing machines; 33,850 radios; and 35,737 bathroom units.

New policy

Bendix Radio will reveal details of its new direct factory-to-dealer merchandising program and show its complete new line of television, radios, and radio-phonographs at the summer Funiture Market in Chicago the first part of July, and at the Western Merchandise Mart, San Francisco, in August.

Junior size

Addition to the Hoover line of electric vacuum cleaners is a small-size upright model designed for apartments and small homes. Weighs 13 3/4 pounds; is priced at $59.95; will be available in October.

What's cookin'

Midwest Mfg. Co., manufacturers of Kitchen-Kraft kitchens, has a 28-page kitchen planning booklet out called "Look What's Cooking in Kitchens." With illustrations tells how to install and decorate the kitchen; has color selector for choosing harmonious color schemes. Available for 25¢ at Kitchen-Kraft dealers.

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ELECTRICAL WEST

Sales Guide

FOR THE ELECTRICAL MERCHANT OF THE WEST © JULY 1948

Roaster Reasons
to use in selling

1 **Cooks four things at once**—a roast, two vegetables, potatoes and gravy.

2 **Cooks your dinner while you are out** for the afternoon. More leisure time.

3 **Does not heat up the kitchen** in warm weather. Here is Comfortable Cooking!

4 **Cooks food economically** for two to ten people. Choose the size roaster best suited to your needs.

5 **Ideal for small apartments,** summer cottages, kitchenettes. So compact it can be tucked away in a corner.

6 **A Complete Stove in Itself.** Performs every ordinary cooking operation. Roasts, bakes, fries, steams and stews. Many models have broiler.

7 **Plug in any Electric Outlet**—no special wiring or installation necessary.

8 **Economical**—Cooks a complete meal for 2c. Every family can afford to own it.

9 **Unsurpassed for Cooking Flavor.** Retains the delicious natural goodness in foods.

10 **Genuine electric cooking**—makes even tough cuts of meat tender. Saves you money on meat bills.

11 **Clean.** No flame, no matches, no soot to darken walls and curtains. Your kitchen needs less frequent redecorating.

12 **Healthful.** Meats and vegetables are steam-cooked in their own juices. Important minerals and food values retained.

13 **Easy to Clean.** No scouring of blackened utensils, no scrubbing of grimy pots and pans. Fewer cooking dishes.

14 **Waterless Cooking.** Vital elements are not boiled away, or poured down the sink with excess water. Delicious flavor is sealed in.

15 **Handy for hot meals on picnics.** The roaster is portable and easily carried in a car, and will keep food warm for hours.

16 **An aid to light housekeeping.** Even bachelors can cook appetizing meals with the aid of Dutch Oven Susan!

17 **Safe.** A boon in families with small children. No flame, no matches.

18 **Operates** on exactly **the same** principle **as the electric range.** Has all the proven advantages.

19 **Makes an attractive gift.** As a wedding present it is practical, decorative, sure to be appreciated.

20 **Low in Price.** An electric roaster brings you genuine electric cooking at low cost. Inexpensive to buy—inexpensive to own.

To Be Financially Successful –

MATCH THE QUALITY

With Your Salesmanship

by

KEN HAMPTON

AS merchandisers and salesmen of electrical merchandise, we are in an enviable position today.

Material developments, the perfection of manufacturing tools and processes and intelligent work have enabled the electrical manufacturers to build and deliver to us the best quality products the industry has ever known. We take great pride in talking among ourselves and to our customers about parts being machined to 1/10,000th of an inch—about steel being processed and painted so the device will not rust. We know the paint does not stain or check and the colors of various pieces match.

Each of you could add a multitude of examples to the list of near perfect manufacturing practices but . . . the fact we all would agree on is that the manufacturers of electrical goods are striving for and approaching the highest quality possible by taking full advantage of all the know-how the human race has acquired in manufacturing.

Contrast this condition of technical quality with the way the merchandising function is performed in our industry. For instance, let's compare the quality performance of our sales forces.

Merchandising is a function older than manufacturing. Salesmanship has been developed through the centuries. The rules for making a sale are as well defined as the rules for making a good product.

What is it then that places us in such a position? What leads us to conclude almost universally that our retail salesmanship is as poor as our products are good?

I believe it is twofold. First, our factory workers work in groups and have the advantage of group competition and standards. The salesman works alone with his customer whom he must get to part with some of his money for our products. Second, in our striving for freedom and individual initiative, we have surrounded salesmanship with the garb of magic. We say a man is a born salesman rather than accept the plain fact that he is doing the right thing at the right time according to known rules.

There have been many calls to recruit good salesmen to our industry. The need for good salesmanship is tremendous. As merchants, let's build standards of perfection for our merchandising and salesmanship equal to the products we sell. Let us:

1. Recruit a good sales force composed of men and women who are anxious to learn and who want to grow with the electrical business.

2. Hold these people to a standard of sales performance equal to the standards the manufacturers are setting for the quality of their product. This can be done by using the know-how which the human race has developed in selling.

Any product not thoroughly sold is poorly sold.

FIGHT TALK IN GLAMOR LAND

PLAIN talk about the things that bother dealers today characterized the annual industry-wide sales conference of the Southern California Radio & Electrical Appliance Assn, June 3, at the Ambassador, Los Angeles. It was no ballyhoo meeting. Rosy pictures and fancy dream markets were not indulged in by any speaker. In fact it was such plain talk that the gathering was unique in its realism.

After preliminary remarks from William J. Quinn, managing director, who had engineered the arrangements for workmanlike, precise operation, Marshall C. Wells, dynamic young president, set the pace for the entire affair. Wells, sales manager for Sues, Young & Brown, appliance distributors, made no bones about what the association could and could not do.

There has been a hue and cry, he said, from some individuals to use the association for protection from this or that. This, the organization does not intend to do. It was not designed as a policing organization but as a promotional one. "Our job must be done by education and cooperation. We are not set up to have administrative control over anybody's business. We do not want to tell anybody to do this or do that."

Results, he said, would be measured in terms of the effort each one put into the organization. "Before you can draw out of it—the same as in a bank account—you have to put something into it. You cannot draw interest on a no-deposit basis." This is a time when clear thinking is needed, he said. The lush days are gone. Dealers and distributors alike must have what it takes to stay in business. He then reviewed the activities of the association—its "magic of electricity" radio program, its FM engineering programs, its adequate wiring promotion with certification of homes, the television information classes, the sales education for new salesmen. He characterized as the fifth column of the industry inertia, incompetence and inefficiency and offered as a solution showmanship, training, understanding, and get-up-and-go whose first letters spelled backwards would indicate what was needed.

Just as realistic a picture of the television situation was presented by Ronald C. Oxford of KFI-FM and television stations. Oxford said the average man and woman has been led to expect too much. When the public buys an automobile it expects good roads. When it buys radio it expects good programs and the same will be true of television. The type and extent of programming has not yet provided sufficient interest for the public. Television, he said, cannot be supported commercially unless it learns to give the public such programs. It will have to take a page from the book of the magazines and newspapers for the programs cannot be sustained on wrestling and boxing three times a week. Showmanship plus good taste and a variety of presentations will be needed. With six stations in the area, if each does a good show, the others will try to top it. He asked for patience not only with the instruments but also the program.

Donald Piper then took over as master of ceremonies for the meeting, and introduced William J. Beaton, president, Southern California Broadcasters Assn. Beaton said the problem in broadcasting was to get more listeners if dealers were to sell more sets. He urged dealers to get more sets in the homes so that each member of the family can listen to a different station. There are 47 stations in the area which can be tuned to and must divide the audience. Listeners thus get a great variety of choice. With population growth approaching New York in a few years, the market for new sets should be big. Radio may change, he said. Independents especially may go for specialized programs. FM also has brought in something new.

The hit of the evening, however, was Bill Cranston, president, Thermador Electrical Mfg. Co., with a hard-boiled talk that rocked the 400 people in the audience with laughter and with hard sense.

There are nine times more people in distribution than in production, said Cranston. As a young engineer he had felt that it was all wrong. But as he grew older he learned the reason for it—human nature. It was nice theory to think of ways to eliminate the distribution organization and cut down waste there but, as long as people want a choice and selection, it takes a large organization to supply it.

He felt that manufacturers have been getting the last ounce out of the machines they use. They buy new machines to meet their competition, to increase production and, if possible, to lower costs. But in selling it works in reverse. In competitive selling costs increase and nothing much can be done about it.

Only a few things can be done on a small scale. If rentals are too high, a dealer can try to find a cheaper place to rent. If his staff is not geared for the right kind of selling, perhaps he can educate it and change it. Government tax eaters take the biggest slice in distribution. Most of this money, he said, goes to screwballs who say the distribution is all wrong, and thus add to the cost of it.

"Don't worry about the chain stores," said Cranston. "The hell with them. I say that and I sell a lot to them. They will sell a lot of merchandise, it is true, but there are still lots of people who want to do business with you because they like you.

"Why don't we all wear blue suits. We could cut the cost of clothing to one fifth of what it is if we were all willing to wear the same color suit, made in one big factory. Instead of that I go to a tailor and pay three or four times what I can get a suit for. Why? Because he knows my name and makes me think I'm important.

"Every guy in this room would buy a yacht if he could. We all want better things. Why on earth should anyone cut price. Just from a matter of figures, if you cut your price 10%, you will have to do 50% more volume in order to get the same amount. If you cut 50% you have to do 120% more volume.

"I know it's a screwy world," he continued, "It's crazy that there are four gas stations on the corner. We all want individual service. If it weren't for the women we'd all live in huts. Gillette would go out of business. Why aren't we in Griffith Park with a sandwich for dinner instead of paying five bucks here for a sea gull?

"So my advice to you is to go out and sell. You can do it. Sell a better way of living, a better way of doing things."

Answering the question, "Why keep on building load when there is a power stringency," Robert H. Cockfield, Los Angeles Department of Water & Power, said, "if you don't, you can't," explaining that the selling now was a preparation for the future like putting money in the bank. The department, he explained, has carried on missionary work for each new product until it can stand on its own feet. He reviewed the former testing and de-

Outspoken Bill Cranston wowed them with plain, unvarnished talk, as his head table associates show; at right of him, Burdick and Moffat, vice-president; at left Piper, Wells, president and later featured speaker; Ralph F. Yambert, who in the right hand picture is addressing the big crowd of Los Angeles dealers that filled the room

livery programs which had been now taken over by dealer organizations. He spoke of the wiring allowances and intimated they may be reduced soon because of the general acceptance of electric cooking. Efforts will be shifted to promotion of adequate wiring to crack the bottleneck of future load building. Likewise water heating will be pushed, home freezers will receive some help, and the electric bed covering, an ideal off-peak load, will be strongly promoted. The electric bed covering, he said, was one appliance the gas industry could not conceivably imitate.

Leo K. Allen, electrical contractor of Hollywood, reinforced the adequate wiring talk by pointing to the dealers interest in an adequately wired job. He told of many dealers having sold appliances which customers were unable to use. He urged dealers to protect the proud owners of a new home by having presold them on an adequate wiring installation.

For retailers Jack Kirchmaier, sales manager, Price Bros., gave an allegory of Joe the salesman of prewar days who made night calls, organized his work, attended sales meetings, and really put in sales effort. The same Joe coming back from the war was too content to get his prospects from the file box of the shortage list. Now, however, it was time for him to go back to work making night calls, using users, attending sales refresher courses.

After hearing from the various branches of the industry on the general subject "Business at Work," Paul R. Buehler, Leo J. Meyberg Co., gave all a preview of what the big All-Electrical Exposition at Pan Pacific auditorium August 20-29 will be. He introduced Fred Tabery, manager of the show for the electrical industry committee, and Tabery's associates. The show is commercially guaranteed from space already signed for. Entertainment will include many spectaculars. There will be scientific and educational features such as are found at world fairs. Even the military forces will have radar and other electric equipment, and the Atomic Energy Commission may even exhibit.

Ralph F. Yambert, sales counselor, closed the meeting on an inspirational note. Picking up the comments made about the poor salesmanship of the present time, he asked who was responsible for the attitude of salesmen. Likewise he indicated that Dun and Bradstreet's are finding more failures in recent months. Surveys have shown that failures were seldom due to the economic conditions surrounding a business but to lack of skill in handling it.

With new people reaching southern California at the rate of 4,000 a week and a 43% increase in population since 1941, he advised a complete revision of point of view. Every dealer, he said, has a public relations problem. Public relations he defined as the art of finding what people want, then giving it to them in the way they want it.

As definite advice, he urged research of each store's customers to find out where the business comes from, how many men and women comprise their market, their age groups, what they like in particular appliances, etc. He urged starting immediately to make an analysis of each man's business. He urged regular meetings with the sales and office personnel, taking them into the dealer's own problems, asking for their help, telling them what is expected of them. The help have a right to expect leadership even as the employer has a right to expect results. He urged the use of personal letters, publicity, news about the business that was of interest and effective advertising. "Maybe you were here before 1941, yet 43% of the people now here were not." What to advertise, he said, was the personality of the individual business. The dealer must make his messages sincere since 50% of the people disbelieve the claims of advertising. He said one must portray a service since nobody ever bought a price tag. Parting shot was that it takes a long time to affect the consciousness of the public and it is a job that must be carried on constantly.

Go All-Electric

All the Rocky Mountain region is going all-electric if the program of the Rocky Mountain Electrical League has anything to say about it, and it is saying a lot. Go All-Electric radio programs are being regularly broadcast from stations in Pueblo, Greeley, Casper, Rapid City, Montrose, Grand Junction and Rock Springs. Script is being prepared by the Arthur Rippey Co. Utilities are carrying ads in 104 local newspapers and Western Farm Life is being used each month.

Field calls have been made by Joe Wright, RMEL representative. Distributors have been given the program to carry to their dealers and to stimulate attendance at dealer meetings. Meetings of dealers have been enthusiastic over the program.

First Drive

Edison launches dealers on ranges and water heaters

FIRST Range and Water Heater Campaign of big-time proportions since the war is under way in the territory of Southern California Edison Co. The dealers are carrying it on, however, instead of the crews of the Edison Co., with dealers following. Impetus for the drive comes from Edison and its energetic merchandise manager, Henry C. Rice. A pilot test was run with water heaters last year and proved eminently successful. Prior to that campaign, water heaters had been moving slowly after the back log had been filled. When dealers learned there were things to sell about an electric water heater, they went to work and increased the sales by almost 50%.

Back of the intent to start a Range and Water Heater Campaign is considerable research. From Edison Co. records which show accurately the number of ranges and water heaters installed, curves of normal rate of sale have been plotted. These curves showed an upward trend on a consistent line from January 1946 to January 1948. The curve started to flatten out in January to a new trend line. This gave a first indication of a need for help in the way of a campaign. The water heater trend line had started to change in November 1947.

Ranges in the Edison Co. territory have been selling at a rate of 9,400 a year and water heaters 3,600 a year. Intention of the campaign is to step up this rate to 12,000 ranges and 4,500 water heaters.

Careful preparation for the campaign was made along lines tested out with water heaters last year. The initial drive was to be set off by first a distributors meeting to enlist their active support and secondly a series of dealer meetings throughout the territory.

The distributors meeting was held

Santa Ana meeting for Orange County dealers heard, among others, Bill Harrison, Sues, Young & Brown, above, and James Green, General Electric Co. Henry C. Rice himself presented the Edison advertising support at the close of that meeting

May 5. Distributors then furnished from their sales personnel and executives, men to present parts of either the range or the water heater story. Twelve organizations responded, including General Electric Supply, Kelvinator, Thermador, Nelson Thomas Agency, J. N. Ceazan & Co., Gough Industries, Graybar Electric Co., Bauer Mfg. Co., Sues, Young & Brown, Sherman - Swenson and Associates, and Westinghouse Electric Supply. These men were broken up into six teams. An Edison man was made captain of each of the teams. Each team was assigned a series of meetings. The maximum number by one team was that headed by J. H. Adams, which covered five meetings. Other teams covered lesser numbers.

To coordinate the story at each presentation, the basic information was worked up and rehearsed by the teams. Edison Co. supplemented this with charts and with kits of materials to be used by dealers in their selling work. Dealer meetings were held in auditoriums or cooking classrooms of the Edison Co. in each of its division and district offices.

Pattern for each program was about as follows: The meeting was called to order by the district or division manager of the utility, who welcomed the dealers. The Edison man who was captain of the team then explained the purpose of the campaign and its general outline. A distributor specialist on ranges then spoke of the range market. Another range specialist from another distributor gave the selling features on an electric range.

Next a water heater specialist spoke of the water heating market. He was followed by another specialist who went into the selling story on electric water heating. The Edison man closed with an outline of the advertising that the Edison Co. was to do as a follow-up of the campaign and to deliver prospects to the dealer.

This help from Edison Co. is considerable. It was explained that large-size advertisements would run in 175 newspapers in the territory during a period of eight weeks. They would be supplemented by a direct mail bill insert to 500,000 customers. This bill insert tells all customers the advantages of a modern electric range and an electric water heater, and ends with "ten good reasons why you will enjoy cooking electrically."

In the kit provided each dealer are window banners of several sizes, price tags to put on each range bearing the identifying cartoon which is found on all advertising, a mat in two sizes for use by dealers in their own advertising.

In addition to these advertising helps Edison Co. men selling adequate wiring, twenty of them, last year sold 4,500 range circuits in new homes and are selling this year at the rate of 6,000. These together with previously wired homes make a rich market without a wiring sales obstacle.

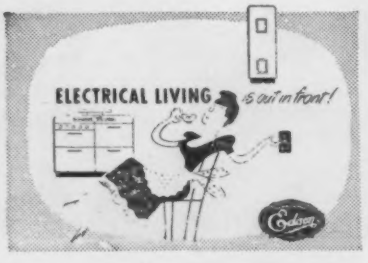
For dealer use small cards containing the basic selling story of the range and the water heater are also provided. One, "Key to More Electric Range Sales," gives basic operating costs on the company's various domestic rates, and general range instructions. The back cover contains the advantages of electric cookery listed in a series.

The water heater folder gives recommended sizes of water heaters, cost data on adequate hot water supply, specifications, locations, insulation, wiring, etc., and on the back the nine advantages of heating water electrically.

These advantages were reviewed for the dealer audience in each case and thus their selling techniques were refreshed. In most instances also a home economist either from the Edison Co. or from one of the distributors, cooked food for the group to taste or sample during the talk on the advantages of electric cooking.

Shown to dealers also was the trend toward electric cooking. The ratio of electric to gas ranges was one to nine. By 1941 it had changed from one to four. In 1947 it was one to each two gas ranges. In 1948 it is expected to be six gas ranges to five electric and by 1950 it was predicted that the ratio would be the other way around, of two gas ranges to three electric. Similar trends in water heater acceptance and market data as to annual replacements, preferences, new homes, were also explained to the dealer groups.

Pictures shown here were taken at one of the first meetings at Santa Ana, which was typical of the dealer meetings throughout Edison territory. In this case Rice himself summarized the things Edison Co. was planning to do and presented the advertising program at the end of the meeting. E. M. Tallon of the Santa Ana office acted as captain. Distributor speakers were Edward Katz of J. N. Ceazan Co., James Green of General Electric Co., Bill Harrison of Sues, Young & Brown, and Roy Denne of Nelson Thomas Agency.



IEEDA Spring Meeting Back To Selling

SALESMEN should meet the challenge of the coming buyer's market with an inquiring mind, a retentive memory, good housekeeping and an interested attitude, Dean Pulsifer, district appliance manager of Westinghouse Electric Supply Co., Seattle, told 300 appliance dealers and salesmen at a series of Spring Sales Conferences of the Inland Empire Electrical Dealers Assn. in Spokane, Moscow and Lewiston, Idaho, during May.

"In this era of selling," Pulsifer said, "the emphasis again will be on the man and his individual efforts. Give your appliance customers and prospects those little extra bits of service, that extra touch of personal attention that makes them realize they are individuals."

Continuing his speech on "Let's Get Back to Selling," Pulsifer said if the salesman is to be prepared for the buyer's market, he will have to apply an inquiring mind to the study of his merchandise, to the reading and memorizing of tags and labels. He will need a good memory to keep this knowledge on hand for instant use. He will have to learn to associate ideas so one will automatically suggest another. He will have to know his sales story in such a logical sequence that, if the prospect interrupts his story with some questions, he can go back and pick up exactly where he left off.

Authoratative surveys, he said, have proved that 87% of all purchases are based on visual appeal. Selling then will require good housekeeping, clean merchandise and display. Present your merchandise as your customer would like to see it in her home, he advised. This must be accompanied by an interested attitude. Make it a habit, said Pulsifer, to be enthusiastic and interested in your customer's desires.

"You will have to sell people harder than ever on the idea that your product is the best. Keep your eyes and ears open for new selling ideas, new products, new markets and new prospective buyers." The salesman's biggest selling job today, said Pulsifer, is to sell himself back into a tough, aggressive and hard - hitting sales frame of mind.

Following Pulsifer's talk, Robert L. Wilkinson, secretary of the Inland Empire Electrical Dealers Assn., introduced at the Spokane meeting the first of the Consumer Panels instituted by his group. In the form of a round-table discussion the housewife members of the Spokane Federation of Women's Organizations presented

their views on electrical appliances and the present methods of displaying and selling them. Dealers learned that advertising is important to women. They want to be able to use it as a guide to shopping. The women felt that the industry should be more careful of its advertising, particularly the wording, so that the statements are both technically and ethically correct. Demonstrations too are of great importance to shoppers, the housewives declared. They praised the increase in store demonstration of appliances and asked for more of it to help them select the appliances most suited to their needs. Post-sale demonstration in the home to teach customers how to use and care for the equipment was also valued. Dealers, they said, should realize that most women are not mechanically minded and need more instruction than is given in printed instructions. They emphasized the personal touch in post-sale contacts and follow-up calls to check customer satisfaction as especially good for customer relations.

Complaint from one women was that the cash customer usually got the "brush-off" after the purchase, whereas the customer who bought on credit got more attention. She asked the industry to adjust its credit policies or at least to make them sufficiently clear so that the prospect didn't feel that she had to buy on credit to get the attention she deserves. The recommendation was that dealers have a flat price for all customers plus a known extra charge for credit terms. The Consumer Panel was wire-recorded for use at the Moscow and Lewiston meetings.

A significant point brought up during the floor discussion later in the meeting came from a dealer who asked the association to consider the condition in Spokane and surrounding towns whereby name brands of appliances were being sold by retail outlets not holding franchises on those brands. His complaint was that these dealers were receiving name-brand merchandise, sometimes in carload lots, when the local franchised dealers were receiving only allocated shipments. The association, he believed, should warn prospects that this merchandise usually carried no guarantee and that in many cases the serial number had been removed.

Chairman of the Spokane meeting was John F. Boothe, president of the Inland Empire Electrical Dealers Assn. Members from the Big Bend, Coeur d'Alene and Spokane chapters attended. Frank A. Tool, supervisor of dealer sales development for Washington Water Power Co., made arrangements for the Spokane meeting.

Continued Training

A LITTLE brings a taste for more. Although the sales training program called the "ABC's of Selling," put on by the Bureau of Radio and Electrical Appliances of San Diego in cooperation with the vocational school, was not something that could be termed little, for it has been as much as most other sales training programs give, nevertheless dealers and distributors and sales people in San Diego are eager for much more. The continuous program "The ABC's of Selling" is going on anyway. But a supplementary program of unique character is to be announced at the big Mid-summer Conference of the bureau in San Diego July 13.

The sales training committee decided that, in addition to the continuous program, more was needed. They called in others who were interested and found a broad need for other and supplementary training. At the last conference, which more than 500 attended, a questionnaire was presented to each member. There were 20 different subjects listed.

This questionnaire was part of the planning which led up to the recent group of sales institutes carried on by the bureau. Although 500 attended, this represented only a quarter of the total number of sales people engaged in some fashion in the sale of appliances in San Diego County.

However, from the answers to the questionnaire, eight major subjects were selected and the sales training committee is now preparing fall classes which will include (1) organization and management of appliance business; (2) effective sales speech; (3) job instruction training; (4) closing the sale; (5) sales management; (6) psychology of selling; (7) sales personality; (8) sociology and drama. It is proposed that the classes will be held in the Electric Building at its 5th floor conference auditorium under the general arrangement of Dan Turner, visual education director for San Diego Gas and Electric Co., assisted by the San Diego Vocational School and its faculty.

Full details of the courses will be announced at the July 13 conference. No enrollments will be attempted at that time however. The idea is to let the thought of these courses percolate and by fall classes will be signed up. Thirty days before the classes actually start dealers will receive all information regarding registration, time of meetings, number of sessions, instructors, etc.

The extraordinary thing about the answer to the questionnaires was the number of people requesting the classes. For the class on organization and management of the appliance business, the replies were also screened to determine what number of actual owners had requested this course. To the surprise of the committee many prominent and long experienced appliance dealers wished to take the course, indicating their desire for refresher information on organization and management.

Preliminary details of the July 15 Summer Conference have been announced by J. Clark Chamberlain, secretary-manager. Full details of the meeting will be reported later. Suffice to say that speakers in the rapid fire one-day conference from 10 a.m. to 10 p.m. will include A. J. Sutherland, a banker to speak on financing trends; Roscoe Imhoff on table appliance selling; M. G. Sues, president, PCEA; Marian Manners, Los Angeles *Times* home economist; Edwin Beale, who will speak on plumbing for appliance installation; Howard Roberts of Whiting Corp. on freezers; and Ray Turnbull, vice-president, General Electric Co., San Francisco. There will also be the manufacturers panels and a dealer panel and several skits.

Dust Off Credit

Denver electrical merchants are better supplied with appliances than their customers are supplied with the wherewithall to purchase, a survey conducted by the Denver *Post* disclosed.

Dealers agreed there is an over supply of most types of small electrical goods, except waffle irons and pop-up toasters; and larger commodities, including radios and washing machines, are available, with the exception of certain sizes of refrigerators, such as the smaller apartment models and one of the two or three larger.

The study revealed that many items in the expensive class are going well, while medium- and lower-priced numbers don't move quickly. Explanation by dealers: Customers desiring luxury merchandise still have cash on hand; the others are running out of money.

Some local dealers are voluntarily taking losses on some electrical goods, the survey shows, and "many merchants are carrying more credit accounts than at any time since Pearl Harbor." Quote from an anonymous merchant: "We've had to dust off our credit apparatus and get it working again . . . because the white collar worker, the mainstay of the retail goods market, is groggy from punishment he's been taking since 1941."

ELECTRICAL WEST

Too Much Emotionalism

SUCH disasters as the recent Columbia River floods always build up a strong pressure of emotionalism which must find an outlet. Blame for the devastation has been placed by no less a person than President Truman himself upon the failure of Congress to appropriate funds for more Columbia River flood control and reclamation projects. Nothing could be more absurd. Other "do-gooders" are saying that a Columbia River Authority, like the TVA, could have prevented the floods. This is equally silly. Finally some of the "free power for nothing gratis" propagandists pridefully point to the successful flood control features of Grand Coulee and Bonneville dams as arguments for more dams of a similar character. Colloquial answer to this is "Nuts."

President Truman should know or his advisors should have told him that the most generous Congress in history could not have done anything about such a flood. There hasn't been enough time nor money enough to provide 40,000,000 acre-ft. of headwater storage or miles and miles of bigger and higher levees. To blame a Republican Congress for the disaster is ridiculous. A CVA modeled along the lines of the TVA could have done nothing. Few people appreciate the marked difference between the Tennessee and Columbia rivers. The latter drains a huge area. Part of its headwaters are in Canada. To provide even a small measure of flood control is a vast and expensive job. Finally to attribute any flood control benefits to Bonneville and Grand Coulee is sheer nonsense. Not a nickel of the Bonneville costs were so allocated, even though the "cheap power" zealots wanted to assure maximum allocations to any account except power facilities. In the case of Grand Coulee only $1,000,000 out of $126,000,000 is so charged. Irrigation, power production and flood control just won't mix. A dam such as Grand Coulee cannot be all things to all people. It frankly was built for power production and irrigation.

Incidentally, one of the overlooked aspects of the situation is that flood control dams are expensive substitutes for programs that will prevent over-grazing in headwater areas, that will curb reckless lumbering, which destroys moisture-retaining cover, and that will insure soil conservation and prevent erosion. Realists know that these are more important than dams in controlling floods.

Sensible and coordinated development of the Columbia River requires more valid arguments than the emotional peg of the recent devastating floods.

Equal to the Challenge

GREAT responsibilities, great challenges and great opportunities lie ahead for the electrical industry of the Far West. The extent of each was set forth at the PCEA's most successful convention last month where attendance, interest and program measured up favorably to any national industry gathering. Impressed by the eleven hundred plus registration, the capacity audiences, the intensity of interest and the enthusiasm, we sought for reasons and came up with four plausible conclusions.

One reason stems from an acute awareness of the size of the job the industry faces to meet its future responsibilities in this area. This alone is enough to overcome any complacency. A second reason is that there is a wholly new generation of people in the industry—a product of the war. They came to seek knowledge and inspiration. And they received generous doses of both. Another reason is that nobody is fooled by today's temporary sensation of well-being and prosperity. There will be tough times ahead that will test the industry's staying power and its salesmanship. The final reason is that people in the industry were intent upon paying sincere tribute to H. H. "Kelly" Courtright, the PCEA president, for his years of unselfish service and sacrifice for all branches of the business.

There was another impressive note about the meeting. It stemmed from an almost subconscious moral and spiritual tone evident in the messages of several speakers. They voiced prescriptions for the future that are best summed up in the words of Isaiah Bowman, president emeritus of Johns Hopkins University: "A certain toughness of spirit is required to face the successive crises of our world courageously.

EDITORIAL VIEWS

The sources of toughness and courage are many. The deepest is faith in intelligent effort . . . But the line of courageous and sustained effort is where all roads must converge, not the line of retreat or despair or cynicism or indifference. Great hearts are the ultimate vouchers of great victories."

A Job for Congress

"THE federal government should put its huge power operations on a business basis or get out of the business." Dr. Paul Raver, BPA administrator, is the author of this statement, according to the press. If Dr. Raver is sincere, and we have no reason to doubt his forthrightness, he should be keenly interested in the program proposed on another page of this issue by Brig.-Gen. Thomas M. Robins, retired officer of the Army Engineers.

Like Dr. Raver, General Robins has had a rare opportunity to study the federal power activities. In fact during his career with the Army Engineers, he grew up with them. He not only agrees wholeheartedly with Dr. Raver's latest conclusion, but he goes even further. He proposes a six-point program which he believes will put the federal government's power project on a business-like basis. We commend General Robins' proposals not only to all federal government power administration officials, but to the members of Congress as well. In the last analysis, they are the ones who must implement such a program.

Stockholder Goodwill

INDUSTRY is showing plenty of originality in its efforts to obtain and hold the interest of its stockholders. Annual reports have been made into motion pictures. Union Oil, a Western company, has done that successfully. Annual meetings have been televised. And stockholders meetings have been taken out into the field. General Electric Company has just demonstrated this technique successfully with a series of regional meetings. Several were held here in the Far West and the interest and enthusiasm they generated proves that they were worthwhile. Utilities might well give some study to the adoption of this technique. Power companies must raise vast sums to finance their construction programs. Much of this money must come from present stockholders. Most Western companies have thousands of local stockholders. All of these utilities can tell potent stories about their growth and their plans for the future. Regional stockholders meetings would give them an excellent opportunity to do this with profit.

FREE competitive enterprise is something we have loudly acclaimed. We have praised it, however, not so much because we have understood it, or even because we have wanted to practice it, but more because it has seemed to be the opposite of dreaded socialism. But many of us who are not socialists unwittingly play into the hands of socialists. Only now and then, among all of us in America, do we find a skilled advocate of free competitive enterprise. Most of us are left speechless in a debate with a socialist, a radical labor leader or any other ardent collectivist. We sputter, but we do not explain. We lose our arguments, and in the process we provide the opposition with a sounding board. We cannot speak our subject well. Nor do we practice it any too well. And to be honest about it, we ourselves have inspired about as many anti-enterprise institutions as have our political opponents. Not only is confession justified and good for our souls, but the meekness that it inspires will make us more willing to learn. For we can learn free competitive enterprise just as we have learned our individual trades and professions. We can master the principles of freedom better than our opponents have learned the jargon of their systems, for the very simple reason that the principles of freedom are superior to anything that the collectivists are able to offer.—Henry Grady Weaver, author of "Mainspring."

Neither Drought Nor Shortages Can

IT WAS not gold the 1,100 came for, June 16-18 of 1948. It was knowledge, experience, inspiration. And the stream they mined for it—the Pacific Coast Electrical Assn. annual convention, its 31st—was rich in all of these. Those who came with the 1848 migration did so greedily to seize what they could, but the 1948 group came to pour their store unselfishly into the common pool of knowledge and experience and draw therefrom more than they could have put in.

For it was a great convention—one of the best. President H. H. "Kelley" Courtright had lifted it out of the despond of the power and water shortage, earlier this year. That crisis had threatened its very existence. But he gave it some of his boundless enthusiasm and optimism, and made it shine resplendently, a great convention.

Walbridge Tenney A. S. Bennion

As he has always done, he looked ahead into the tremendous future of the electrical industry in his presidential address (see ELECTRICAL WEST, June 1948, p. 82). In this future he called upon the younger men in the industry, many attending their first convention of the association, to make the most of the opportunities before them.

Welcomed to San Francisco by his company president, James B. Black, Pacific Gas and Electric Co., the latter recalled that 25 years ago, almost to the day, he, himself, had opened the seventh convention of the association in the very same room. In that convention, Black recalled, he had said in his report, "the electrical industry has become such an important factor in the social and economic structure that we must continually have before us its larger problems in order that we may more helpfully and thoroughly assist in its upbuilding. What affects the social and economic structure as a whole will in turn affect the electrical industry for better or for worse; and with our important place in this structure, it cannot function as

Keep A Good Industry Down—PCEA

it should without the industry's intelligent service.

"That statement is equally true today," he added. During those 25 years the number of customers has trebled, kilowatt-hour sales are six times those of 25 years ago, gross revenue four times as large, but the average rates for service are down 40%. Black mentioned as one of the major problems of the present era the restoration of normal reserves in generating capacity, depleted by the tremendous influx in population and the greatly increased postwar loads; and the maintaining of personal relationships that are important for good teamwork. "At this time — perhaps even more than ever before — it is essential that our relations with our millions of customers be kept on a friendly, cooperative plane. On our part, this requires good physical service and, what is at least of equal importance, the establishment of a sympathetic understanding of the consumers problems and an active willingless to find their solution."

While the following report on the convention will summarize and digest the major addresses and the activities in the three sections of the association's working committee groups, three addresses will be found elsewhere. The paper, *Pacific Southwest Water Supply*, by Prof. R. G. Folsom, University of California, is scheduled for the August issue. Those of Brig. Gen. Thomas N. Robins, U. S. Army retired, consulting engineer of Portland, and D. D. Smalley, PG and E vice-president in charge of operation, will be found elsewhere in this issue.

At the closing business session of the association, M. G. Sues, president of Sues, Young & Brown, Inc., Los Angeles, was elected president to succeed Courtright. In accepting the presidency Sues turned the attention of the convention, made up of men from the engineering, financial, legal, construction, and sales branches of the industry, back to one of the forgotten men of the business, the

Courtright - Sues Sanders

specialty dealer. First he recited figures of the continuing boom in retail sales and business activity, saying that the association can anticipate a very good year ahead. However, there was one discordant note. A recent New York *Times* editorial called attention to the fact that specialty selling stores have lost ground despite the high volume of sales at the retail level.

Sues declared the specialty electrical dealer had always been the backbone of the sales end of the business. Instead of too few kilowatts, said Sues, very soon in the future the utilities may find themselves with too many and a need to sell. "When that time comes Dunlap Smalley and I may have to go out in the field to try to find that backbone dealer because we will need him."

Two pioneering jobs face the industry immediately. First is television which must be developed from the utility, and the dealer standpoints. The second is the home freezer which is a good business for everybody. He felt there was a man-sized year ahead for the industry which would offer opportunities to the men and women in it who were willing to pitch.

In presenting Courtright with a scroll on behalf of the association for his year as president, Sues paid tribute to Courtright for his untiring effort and for always, from the beginning, being willing to work on behalf of the industry above and beyond his own immediate job.

Manager-Director Victor W. Hartley in his annual report to the convention paid tribute to the fine fellowship in the association, declaring this industry especially fortunate in the number of "extra special good Joes" who have learned to work so well together. Membership has now reached 193 company members and 2,758 individual personal members, a total of 2,951.

The code and ordinance activity was commented upon. Thirty-four cities and one county have adopted the 1947 edition of the Uniform Electrical Code. Twelve more are pending, and the previous edition was adopted by 74 cities, 3 counties, and 1 fire district. The committee's "Statement of Policy" also was cited as one of the year's achievements. In the adequate wiring committee, 819 homes have been certified. To accomplish this 12,765 calls have been made. These have resulted in an installation of 2,943 outlets not in the original plans, 5,373 electric range circuits, 3,156 electric water heater circuits, 7,965 bathroom heaters.

The highway lighting committee has worked closely with the engineers of the California Highway Commission. The liquid petroleum gas committee has continued the exchange of information relative to this competitive fuel. The agricultural power handbook is being brought up to date.

Spectacular success attended the home economics workshops held by the home economists committee in Los Angeles and San Francisco with attendance of 85 and 92 respectively. These were for refresher courses and drew attendance among dealers, demonstrators, representatives of school departments, home economics editors, etc.

Hartley also mentioned the safety rules committee study of the state safety orders, the meter committee study of metermen's courses, and the conference in Fresno last December.

Treasurer N. R. Sutherland, vice-president, Pacific Gas and Electric Co., made a customary brief and good-humored report on the finances of the association. He declared they were in good shape to meet all claims against the organization.

In the election of officers, in addition to M. G. Sues as president, the association elected the following directors: R. N. Dreiman, vice-president and comptroller, Coast Counties Gas & Electric Co.; re-elected directors include J. W. Borda, Pacific Coast manager, The Okonite Co.; H. L. Harper, Pacific district manager, Graybar Electric Co., Los Angeles; A. G. Jones, district manager of apparatus sales, General Electric Co., San Francisco; T. L. Rosenberg, president, T. L. Rosenberg Co., Oakland; M. G. Sanders, vice-president, Central Arizona Light & Power Co.; E. D. Sherwin, vice-president, San Diego Gas & Electric Co.; W. G. Willson, manager, Westinghouse Electric Corp., Los Angeles; directors carried over are R. E. Arbogast, vice-president, Newbery Electric Corp., Los Angeles, H. H. Courtright, division manager, Pacific Gas and Electric Co.; W. E. Cranston Jr., president, Thermador Electric Mfg. Co., Los Angeles; C. C. Ernst, vice-president and general manager, California Electric Power Co., Riverside; C. W. Goodwin Jr., district manager, General Electric Supply Corp., San Francisco; W. C. Mullendore, president, Southern California Edison Co.; D. D. Smalley, vice-president, Pacific Gas and Electric Co.; G. C. Tenney, vice-president, McGraw-Hill Publishing Co.; F. A. Tracy, president, Sierra Pacific Power Co.; R. R. Walbridge, vice-president, Southern California Edison Co.

A brief meeting of the board of directors had been called to select vice-presidents and chairmen for the three sections of the association. This resulted in the appointment of W. G. Willson as first vice-president and D. D. Smalley, as second vice-president. N. R. Sutherland was renamed treasurer.

H. S. Bennion Field

Administrative services chairmen for next year will be J. K. Uhler, Southern California Edison Co., and L. W. Brillhart, PG and E, will be vice-chairman. Business Development section chairman will be J. S. C. Ross, PG and E, with C. L. Moore, Sunbeam Corp., Los Angeles, as vice-chairman. Operating Economics chairman will be D. R. Jenkins, Westinghouse Electric Corp., Los Angeles, and F. D. Beardsley, Coast Counties Gas & Electric Co., Santa Cruz, vice-chairman.

Credit for as smooth a running convention as ever experienced by the association goes to the organization of convention committees, directed skilfully by O. R. Doerr, vice-president, PG and E, general convention chairman. Assisting him as stage manager was William A. Hynes, of the same company. The list of committeemen is long, all of whom served long and faithfully to make the many aspects of a convention a success, working under the following, as chairmen: Attendance, R. R. Walbridge, Southern California Edison; Banquet, Charles W. Goodwin, General Electric Supply Corp.; Cocktail party staged by manufacturers and distributors, H. T. Atwater, Leo J. Meyberg Co.; Golf, Graham Holabird, National Electrical Products Corp.; Hotel, Harry A. Lee, PG and E; Ladies Entertainment, F. E. Bodine, Westinghouse Electric Corp.; Program, George C. Tenney, ELECTRICAL WEST; Publicity, A. X. Schilling, Southern California Edison; Reception, Harry F. Hartzell, Maydwell & Hartzell; Registration, M. S. Barnes, General Electric Co.; Transportation, James S. Moulton, PG and E; Ushers,

Courtright Black Smalley Borda

J. S. C. Ross, PG and E; Decorations and signs, Chad Hulburt, PG and E.

In the following will be found individual reports of the three general sessions, the addresses given in them, and reports on the meetings of the three sections and their individual committees.

Getting Along With Our Own People

Dr. Adam S. Bennion

Vice-president, Utah Power & Light

JUST when you think you have found the successful formula for getting along with your own people, along comes a new generation Dr. Adam S. Bennion, vice-president, Utah Power & Light Co., told the convention Thursday in an inspiring and timely address. "And you don't find all of the answers in books," he said.

A successful industrial relations program is built around four steps, in his opinion. There must be an awareness of the basic problem; there must be a real interest in finding a solution; and there must be a growing understanding of peoples' motives and interests. Finally all of these must be incorporated into a workable program.

Dr. Bennion outlined the findings of a survey of 2,200 Utah Power & Light employees to determine what they wanted from the company. He summed up the findings with the assertion, "they want more." He listed six benefits the employees sought in the language they themselves used. Heading the list was adequate wages. Asserting that too many managers think they know just exactly what a person is worth, he described the job evaluation program used to determine what constitutes adequate wages for his own people. Scales were set after consideration was given to such things as comparable wages in other industries in the same and adjacent areas, to changes in the cost of living, to company earnings and their distribution and to responsibility, hazards, training and length of time on the job.

The second thing his people wanted was promotion and a chance to grow. Utah Power & Light has developed graduated scales of wages to cover a five-year period. At the end of that time an employee reaches either a ceiling or has demonstrated his eligibility for promotion. Dr. Bennion is a great believer in careful selection and proper training. Marked success with a course for training apprentice linemen has resulted in a similar course for station operators.

Satisfactory working conditions was the third item on the listed benefits desired. A joint committee comprised of representatives of management and the workers is constantly reviewing conditions and making recommendations.

Fourth item was a feeling of security. Involved in this, Dr. Bennion said, are tenure and all kinds of insurance—health, accident, life and hospitalization—both for the worker and his family. "If you don't do it, the government will," he declared, "and it will take your money to do it with, and the bureaucrats will take full credit for having done it." His company has a retirement income program in which the company and the employee share the costs equally.

Recognition, or as he described it, "a place in the sun," was the next item sought by employees. Every individual is sufficiently human that he will respond to recognition or commendation, the speaker declared. "How many letters do you write to how many people on how many achievements?" he asked significantly.

Finally the employees sought for a sense of belonging to the organization. They want to believe sincerely that they are a part of the family. "They would like to know that the company belongs to 'them' as well as to 'us' and it is up to us to convince them that this is so," he said.

Because American power companies are in the forefront of the fight to preserve free enterprise, Dr. Bennion urged that management take every possible step to insure that the industry will get along with its own people. "With 250,000 men and women who know that they belong to a great and progressive industry, we will have on our side a militant and vocal group who defeat industrial socialization," he concluded.

Getting Along With Our Public

Phillip Woodyatt

Dan E. Clark II and Associates

AFTER making a large number of public opinion studies for electric power companies, we know that the reaction of the public is just about as irrational as it could possibly be. But the fact that a public belief or a public attitude doesn't make sense does not make that attitude any less bothersome, nor any less dangerous. Quite often, a public attitude based on misinformation — or no information — is far more dangerous than a fully informed one.

The public relations problems of privately owned electric companies are just about as tough — and certainly just as important — as any in the entire field of American business today. There are several basic facts which contribute to this situation. One of them is the simple fact that utility companies are more "public," in the broad sense, than any other companies. A larger percentage of the people use electricity than buy gasoline, or read newspapers, or even shop at stores. Your services contact the public daily, and in a great variety of ways. The smallest irregularity in that service, whether an act of God or man, produces the instant, heated kind of reaction which jams telephone switchboards. Moreover, your bills arrive

with the regularity of the tax collector's notice. It is through these contacts that public reaction grows, and we must recognize, first of all, that public opinion is largely motivated by self-interest, and often a fairly short-sighted self-interest.

Simply because the public *is* so susceptible, the dangers are great — and the need for intelligent and insightful public relations is equally great. One thing is clear: the most effective weapon of the politicians who seek to wipe out private power is public misinformation and public confusion. That is the root of the problem, and it is the root which must be attacked.

Our organization has developed its research along regional lines — because we realize that no average reaction is applicable to every region. Each power company's service area has its own individual problems, and any public attitude study must be designed in the light of these practical, individual situations. I can give you some facts about attitudes in general —a composite; and you might well find these facts interesting. I can tell you, for example, that about 30% of electricity users are dissatisfied with rates, and, in many cases, with service. I can tell you that a significant portion of the public does not believe the information given them by their local power companies; I can tell you that approximately 25% of our customers think they would be better off if our company were owned and operated by the government. I must also say, however, that these findings are averages, which vary considerably from one service area to another, and I would not like you to think that I am giving you any facts which necessarily describe the situation of any given company.

Speaking purely as a fact-finder, however, I should like to suggest that our findings in the field of power and the public indicate three basic things. First, that many of us tend to overestimate the amount of knowledge held by the general public; a vast number of your customers don't know a kilowatt from a South African antelope. In the second place, the enemies of private power are using this lack of knowledge for all it's worth — and it's worth plenty. In the third place, the time to use public relations is before the house is on fire.

One final admonition is in order. The public knows far less about the power business than any of you can conceive. So put your messages in simple language. Make them so simple that to you and your erudite associates the story appears almost silly. Then keep repeating it. Simplicity and repetition will help in winning and keeping public understanding.

Which Way America?

Dr. Algerdas N. Cheleden

Attorney at law, Los Angeles

TWO opposing philosophies face the world today and, although there can be no compromise between them, Russia's materialism eventually will destroy her, Algerdas N. Cheleden, Los Angeles attorney, declared at Thursday's luncheon, in a speech which brought his audience to their feet in applause.

Certain characteristics which have come to the surface, a certain restlessness, indicate that the world is struggling with an idea, waiting for the next step to take in the march of mankind, he pointed out.

Russia's philosophy, based on force, could hardly be expected to command leadership, according to Cheleden, yet her cold philosophy is challenging the only power that can resist her. A compromise between communism and our form of government may be attempted, he said, but there can be no compromise—one or other must give way.

Restlessness develops in other countries as they try to decide which philosophy to follow. South America, for instance, is trying to apply our philosophy, but our constitution doesn't work the same there, because the struggle out of which it was conceived is lacking. England's basic struggle is for the survival of age-old concepts of freedom attacked by a dictator type of economic system. The Orient is seeking the secret of the white man's power and is demanding her place in the world. If an empty stomach wins the Orient over to Russia's philosophy, it may mean the doom of human freedom, Cheleden declared.

Within Russia's philosophy are three things that will destroy her—materialism, collectivism and an attempt to eliminate the religious urge. We should not, however, sit back and wait, he warns, but should encourage this destruction.

Mankind has taken four progressive steps through history: establishment of religious, economic, political and economic freedom. Basic thinking will be based on a guarantee of basic freedoms—not necessarily a negative approach to get away from oppression but freedom to live as each man sees life, he said.

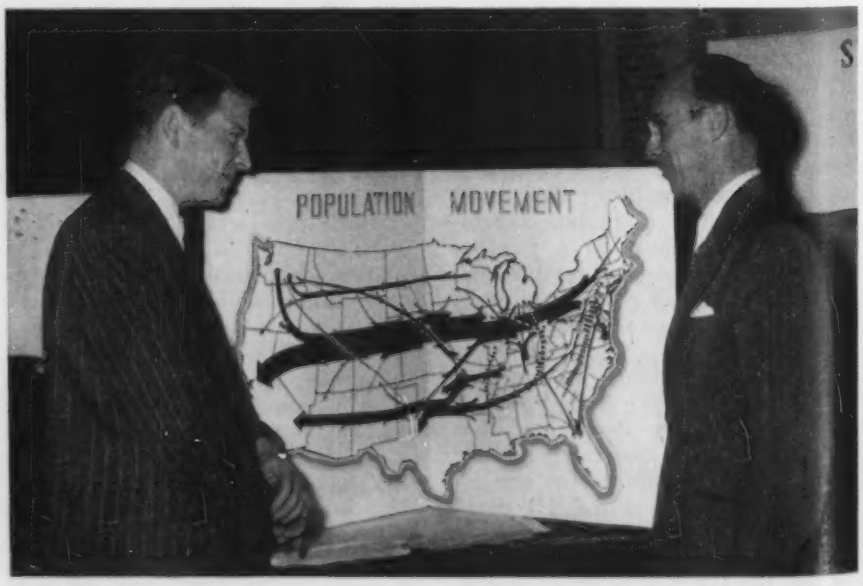
America's strength, Cheleden pointed out, is not in her financial and economic power but in a spiritual type of leadership.

"You and I must direct America back to the fundamentals that made her great," he urged. Citing Arnold Toynbee, he told of the 21 civilizations that had disappeared when they ignored spiritual values. Such values are part and parcel of our philosophy; remove them and you have America flat, he declared.

Every nation and every civilization that has had a completely materialistic philosophy has failed when the critical test came. And the first time Russia meets a crisis, her materialism will destroy her, he declared. Christianity in 50 years destroyed 1,000-year-old Rome, because it added mercy to a cold concept of justice.

Mankind has a deep urge to know the mysteries of life. He wants to know whether or not there is a God. Russia

Woodyatt Palmer



cannot tell people to ignore this deepest urge in life, and survive.

Russia is trying to turn back the clock 500 years to an archaic system, where the human being did not exist as an individual.

The Pilgrims gave the world a new idea, with the concept that a man made in the image of God is capable of ruling himself. It is difficult, however, for Europe to understand what we mean by political freedom.

No rights are guaranteed us in our constitution, because basic freedoms are inalienable rights given by God. The constitution guarantees against the people in office.

Cheleden concluded with a moving account of his own boyhood as the son of immigrants who had come to America to gain freedom. His rise from a slum environment could only happen in America, he said, where "all you need is a little guts."

Let's bring back to ourselves and to the world recognition of those deep values — freedom and democracy, he urged.

Intangibles of Leadership

Dr. John O. Moseley
President, University of Nevada

RIDING across the Pacific on an aircraft carrier as its guest, Dr. John R. Moseley, president University of Nevada, said he changed his mind about the talk he was to give on *The Intangibles of Leadership*. Thinking on the subject he concluded that personality, that elusive quality, was one of the greatest intangibles of leadership, that all salesmen depended upon it, that all people needed it for success in life. Yet it cannot be defined. There is no one who can transmit it or tell how to transmit it or acquire it. It comes from the *you* behind the mask that everyone carries about with him. Psychologists have been trying to find out what it is. It seems to emerge most from those who have had to struggle and meet obstacles. He said that the aim of all education is the perfection of personality.

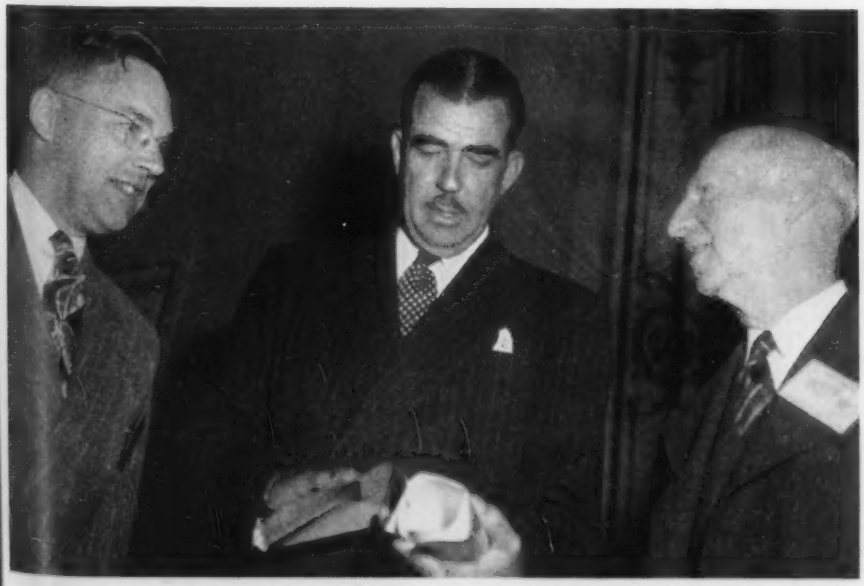
In seeking for a pattern for the personality, he considered some of the great personalities in history. The master personality of all time, however, was Jesus Christ.

Then Dr. Moseley analyzed the characteristics of Jesus in trying to arrive at some of the elusive qualities of personality. He said one must have an alert mind, be observant of nature, observant of the ways of men. He pointed out by biblical allusions that Christ knew history and political theories, had an intuitive type of mind, one that went straight to the point and got the whole picture at once. It was a positive mind in contrast to the "thou shalt not" of the old testament. Jesus said what to do and how to do it.

He talked of His physique and personal appearance and His vibrant quality of health and dynamic action. He spoke of integrity as a part of personality, showing how though tempted and criticized He had held to ideals. He discussed the importance of emotional life and sense of humor, the love of people and the recognition of the dignity of man. Mankind before His time had been little better than the animals, but Christ gave a new concept of him as a little less than the angels.

He concluded dramatically by speaking of the place that passion had in a personality, the passion to endure, to suffer, for that which is greatly desired. He urged that America today have as great a passion for democracy and the freedoms of mankind as the Russians seem to have for their ideologies.

Folsom Sanders Robins



Industry Marches Westward

Dr. Dwight Palmer
Consulting Research Engineer
Los Angeles

CITIZENS all over the nation are concerned with the westward migration. The journals and newspapers give evidence of this attentive, almost fascinated, preoccupation with industrial growth. In addition to the long-standing interest in industrial change there are today several relatively new reasons for intensifying the alert citizen's concern with so dramatic a story as this westward industrial push. Several of these newer reasons are worthy of direct analysis.

First of all, it is growing increasingly evident that a community reflects the industry, commerce and trade upon which it is built and can be no stronger than these permit. Even the average citizen is beginning to perceive this vital, basic relationship.

As our expanding population ultimately gives way to a much slower rate of increase, then the growth of certain areas will no longer rest so easily upon a differential rate of increase. Instead, those cities and regions which grow will be taking actual population elements away from other regions which are barely holding their own or even shrinking. Under such circumstances, competition for business will surely be stark, harsh and bitter, and for some cities and regions the handwriting is already on the wall.

Then, too, the social planners are in steady attendance and evidence ready willingness to point out current shortcomings in our industrial patterns and to urge full government control in the bland name of "planned harnessing of our natural resources."

Finally, to citizens vulnerable to atomic annihilation the location of at least the basic industries has become

indisputably a phase of national defense.

These are typical of the current reasons why such urgent attention is given to the westward migration of industry.

With what detailed types of change are we now faced? There are, in the main, four.

The first is the movement from place to place of the plants and businesses which make up the industrial fabric of America. Here is a plant that is expanding and adding more people and increasing its capital resources. Here, not far away, is another plant that is rapidly shrinking and losing its population of skilled artisans to other nearby businesses. A third plant is holding its own, losing some people, gaining others, but maintaining its usual size. With this type of industrial ebb and flow we are all familiar.

The second type of change has to do with the geographic mobility of our population. On a national scale there is a heavy westward movement of population, with a secondary movement from south to north. In itself, the movement of so many thousands of people is a tremendously noteworthy phenomenon. Moreover, an analysis of the details of this mass migration is also of distinct interest. For example, the extent and timing of movement vary in relation to the race, sex, cultural background, and technical ability of the migrants. Much of the movement from south to north is that of the negroes, and already the problems of Birmingham have reached Seattle and Boston. From the angle of timing, the men typically move first, and the usual frontier town has an abnormally high percentage of young people who tend to move more readily than do their elders. The social background and tradition of these people on the move are also involved, for these individuals bring with them their culture and traditions, their customs and habits, as well as their material goods.

A third type of change has to do with the ways in which peoples' skills "migrate" during this geographic movement. Each plant has its own ratios of semi-skilled, skilled and unskilled. And, as the people move from place to place, individuals jump from one category to another, or, losing out in the economic struggle, they drop back a notch in their relative prestige and position.

A fourth and still more fundamental type of change is that relating to the shifting ratio among our major industrial groupings. Here we deal with the (1) primary activities, those industries which take materials out of the ground, such as agriculture and mining; (2) secondary industries, those which change the form and structure of raw materials taken from the earth, such as manufacturing; and (3) tertiary activities, those which are concerned with services, such as sales and with all phases of technical-professional work. The balance of these three is a very important aspect of a community's economic life.

This kind of evolutionary change in the economic life of the people is much more than a mere matter of happenstance. It is effected through the active or passive willingness of many types of people to accept technological changes. Management must be willing to accept such developments and to watch with care the ratio of employee skills used. The consumer must be on the alert for new ways—more satisfying ways — of getting the kind of goods and services he desires. The laboring man must be willing to see changes in technique, production and methods; he must not cling to the idea that the way in which his father did a job is the best way in which it can be done. The labor leader must be willing to accept these modifications, instead of fighting for the traditional methods merely because they are familiar. And the government officials who have become so large a segment of our economic life must be willing to go along with, if not actually to lead, the people in their seeking new and ever-changing types of services which make for a higher and technically more advanced standard of living. Of course, such change is frequently unsettling and disturbing to our usual way of life, but only through such evolutionary development can the nation as a whole gain through the migration westward of so large a segment of the American population and industrial effort.

Challenges Ahead

Here is the challenge I see in the years just ahead as a result of industry's westward migration.

1. Judged in its widest perspective and in light of its resources—material, human, cultural—the future of the Pacific Coast is as promising as that of any metropolitan area in the history of western civilization.

2. In light of the migration of population, the recent advent of unionism, the rapid shift in consumer demand and production methods, the new and intricate complexities of the air and atom age, the next ten years in the development of the Pacific Coast give promise of being as hectic, unsettling and full of intellectual upheaval as any through which any modern region has ever passed.

3. At no time in America's development have industry and the professions and services which work with it faced so severe a challenge to their intelligence, energy and leadership. Every management technique by which to solve the problems of industrial migration and movement in terms of high level output standards is urgently requisite if our managements here on the Pacific Coast are to retain public confidence in their continued industrial stewardship.

4. The proper location of industry and the proper combination of land, labor, machines and managerial skill constitute a troublesome galaxy of problems within this wider context.

5. As services in touch with these industrial requirements, your profession and mine are obviously faced in this connection with as rich an opportunity for usefulness as any in their history. Our customers (those of long standing and the newcomers) are destined to be in as continuous and as critical a need for courageous counsel and imaginative leadership as they have ever been. The adequacies of your competence and mine will in real measure help make or break the individual firms we serve.

6. Among all the various means of helping these new industries to locate properly it appears that what I have called "consultative decision" offers the maximum gain in terms of economic well-being, and social and community stability. Surely, no problem could be more fraught with community interest, for it is clear that no modern city, no modern region can be better, stronger or more successful than the trades and industries which constitute its economic base.

7. Only if each of us plays his integral part in the kind of planning which makes sound community development possible will we meet the challenge of the industries and people on the move who are looking to the Pacific Coast for the fullest utilization of their economic opportunities, their access to our American heritage.

Beardsley Straub

Operating Economics

A. D. Bragg, chairman
W. T. Johnson, vice-chairman

ENGINEERING-WISE the convention was most successful, too. Parallel sessions on two afternoons gave committees of the Operating Economics Section opportunity to delve into the many problems confronting utility engineers. Meetings were unusually well attended, even the less spectacular meter and transportation committee. Following are summary reports of the several group meetings.

T and D Group

William R. Johnson, sponsor

Meetings of the Transmission and Distribution group ran the gamut from theory through construction economics, operation, and patrol of transmission systems. Discussions covered a new network calculator, economic factors affecting selection of transmission line conductors, problems of regulator switching and series capacitors, installation of armor rod on hot 220-kv. lines and helicopter line patrol.

The group got away to a fast start with a paper on relative costs on line construction with five different types of stranded conductors. E. M. Wright and E. G. Lambert of PG and E presented results of a study limited to stranded 2/0 equivalent in all-aluminum, aluminum with alloy core, ACSR, medium hard drawn copper, and type F Copperweld copper. A profile along an actual line approximately seven miles long was chosen, representing nearly all the types of country through which a line would pass in the lower elevations. For each of the conductors a new line was laid out along this profile with careful attention to the most economical combination of heights of poles, types of structures and span length. Results of the limited study indicate that for the 2/0 equivalent on a 60-kv. line in the light loading district assumed, all-aluminum ACSR gives the lowest total cost at present prices. Surprisingly enough, difference in costs of structures complete with guys and anchors was small. The greatest differences were found to occur in actual costs of conductor and fittings.

First a-c network calculator installed and operated by a business-managed public utility on the Pacific Coast was described by Abe Tilles, PG and E. It will be used to study power flow, short-circuit conditions and transient stability problems on the PG and E system. A colored movie showing installation of armor rod on energized 220-kv. lines of So. Calif. Edison Co. was presented by C. A. Fischback and J. Lummis of that company. The same film will be presented before the forthcoming conference on high-voltage problems in Europe.

Relocation of capacitors further from the station was suggested by J. A. Jensen, PG and E, as a solution for regulator switching problems caused by heavy installation of shunt capacitors on distribution lines. W. J. Walsh described three separate installations of series capacitors in distribution lines of the San Diego Gas and Electric Co., and indicated that a satisfactory economic solution of technical problems has not yet been reached.

One high spot of the session was a colored film illustrating the use of helicopters for transmission line patrol. Discussion leader D. Z. Bigler indicated that Southern California Edison has found over a period of one year that over-all costs of patrolling by air are less than ground patrol costs. This was confirmed for the PG and E by Roy Cowles, who emphasized in addition the saving in valuable manpower. K. W. Flint, partner in one of the helicopter patrol companies, supplemented the discussion with background on the financial and operating problems of their business, and answered a multitude of questions from the floor.

Substation Group

A. A. Straub, sponsor
Frank D. Beardsley, presiding

How eight basis requirements for distribution substations are met was described in an illustrated paper by M. T. Campora, So. Calif. Ed. Co. Edison requirements are: (1) reliability; (2) flexibility; (3) adequate protection; (4) low noise level; (5) adequate instrumentation and relay protection; (6) economy; (7) safety, and (8) neatness and compactness in appearance. Much progress has been made by the Edison company in developing architectual designs to harmonize with buildings in the neighborhood where substations are located.

The subject of metal-clad substations was divided into four parts. V. G. Murdock, Allis-Chalmers, made the principal presentation. He illustrated by slides the various types of available metal-clad factory substations and commented upon their application. Harvey Skow, Westinghouse, showed effect of the primary distribution on the selection of metal-clad equipment. Systems were contrasted, i.e., radial, loop, primary network, etc. Effect of the sub-transmission system on the selection of equipment was shown by V. E. Kaste, G-E. Meldrun, PG and E, Oakland, illustrated how, by emphasis on landscaping and concealment, they had been able to place unit substations in residential and commercial areas without public objection.

Complete supervisory control has been applied to eight substations to

Johnson Bigler Flint

Plummer Kipp

date on his system and more are scheduled, J. F. Sinnot, San Diego G&E, told the group. Substation capacities range from 12,000 kva. to 134,000 kva. R. B. Pollock, So. Calif. Ed., described the very extensive supervisory control program of his company. In all 40 stations will have complete supervisory control. Type of control channel selected and its influence on choice of equipment was discussed. Microwave space radio channel will be used for latest supervisory equipment ordered. R. H. Miller, PG and E, described the alarm systems used by his company in connection with a system-wide program of automatic substation control. Type of telephone protection for lines paralleling high-voltage lines also was covered.

F. S. Benson, PG and E, and R. K. Klumb, So. Calif. Ed., discussed the many problems of circuit breaker modernization and interrupting capacity requirements. Difficulty of securing new equipment, inability often times to place a new breaker in space occupied by the old, inability to modernize the old breaker, were mentioned. Expedients that have been used in meeting these problems are: (1) modernization of older breakers where economically feasible; (2) replacement where space requirements are adequate for the new design; (3) use of double bus so that stations may be sectionalized to reduce interrupting duty requirements; (4) current limiting reactors have been used on transformer banks and feeder circuits on the PG and E systems; (5) station interconnections have been rearranged and sectionalized to limit interrupting capacity required.

Hydro Generation Group

C. W. Schweers, sponsor

O. R. Bulkley, So. Calif. Ed., and Frank I. Lawson, PG and E, reviewed the problems involved in automatic tie line load control for interconnected power systems. They described interconnections which have been in use for some time elsewhere, particularly the 18,000,000-kw. interconnection in the east and the Pacific northwest. A recent development in the eastern interconnection is the trend toward telemetering and control which would permit the load switchings on each system, or group of systems to be more completely absorbed, each in its own area, by the necessary adjustments to generation. This, it is expected, will result in smoother and more generally satisfactory regulation. Bulkley described the telemetering and control recently placed in service by Edison for regulating the load on its tie with Metropolitan Water District at Hayfield pumping plant. Loads on the tie are telemetered from Hayfield to Hoover by means of frequency-shift carrier current on the 220-kv. transmission line. Control equipment at Hoover automatically makes the necessary adjustments on the district's generators at Hoover plant. Moody, G-E, commented on this new variable frequency telemetering system, saying that it makes possible continuous and instantaneous readings and is not susceptible to transient noises—hence has great advantages. Tom Curtis, PG and E, sees no great advantage in continuous telemetering for most purposes because load-frequency changes are so slow and oscillating that quick response would fight against the thing desired.

Much discussion revolved around what to telemeter and where to place the information. Trend is to bring everything into the central dispatching point. Edison thinks the most important thing is to know major substation loads and have this information in the dispatching center. Collins, PG and E, says type of system is the governing factor in where and what to meter.

Various methods of water measurement applicable to efficiency tests on hydraulic machinery were reviewed by Fred C. Scobey, ASCE. He concluded that no measurements other than weighing or volumeteric are good enough to discuss in terms of 1% deviation. Scobey said he understands that Standard Oil is introducing radio isotope slugs into pipe lines and picking up passages with a geiger counter. It sounds good to him.

D. D. Dutter, So. Calif. Ed., discussed fire protection of hydro generating stations. New methods of fire protection for hydro plants and substations were reviewed. CO_2 and Cardox, backed up by the customary water fire fighting methods, are current practice, he said.

Steam Group

D. R. Jenkins, sponsor

Slides and operating models were used by L. F. Richardson, Bailey Meter Co., in discussing applications of electronic measuring and control equipment in steam power plants. Many electronic devices are necessary today, he said, to control modern high-pressure, high-temperature steam plants.

Group discussion of problems of condenser cooling water treatment and scheduling of supervisory personnel on extended plant operations, proved valuable through interchange of experiences and ideas. No conclusions could be reached since problems are local to each plant.

An interesting highlight of one session of the steam group was a report by C. F. Dalziel, associate professor of electrical engineering at U. C., on research conducted at Berkeley to determine if sea growths in water tunnels can be killed by electronic shock. Dalziel said that so far conclusive proof was unavailable as to effective-

Malloy Brinton

Middleton Shaw

ness of various electric shock methods and that further research will be necessary.

Meter Group

E. B. Kipp, sponsor

The meter committee made arrangements for expanding the work of the Pacific Utilities Requirements Coordinating Committee to include all utilities in northern California. E. B. Kipp, San Diego G&E, reported that the coordinating committee has made excellent progress already in southern California. Meter superintendents of all utilities in the south have been meeting monthly to standardize their requirements for electric service facilities. Switchboard specifications have already been made uniform so that identical units are acceptable anywhere in the area served by these companies. Maximum allowable loads on 50-amp. socket meters have been standardized. Where standards have been decided upon, the advantages of mass production, lower cost, less confusion on the part of contractors, architects, engineers, customers, and the utilities themselves have already become obvious. There are also fewer objections and rejected jobs by electrical inspectors.

Clive Baugh, PG and E, reported that his company is much interested in the work of the southern California group and is now preparing letters to all northern California utilities suggesting the formation of a similar group to parallel the work of the one now functioning, and to cooperate with it. E. B. Kipp stated that it is hoped similar committees eventually can be formed in Oregon, Washington, Nevada, Idaho and Arizona in order to standardize electric service requirements for all Pacific states.

Communication Group

C. T. Malloy, sponsor

Representatives of several companies reported on their present and future use of two-way radio communication with an exchange of constructive ideas on specific problems such as selective calling for trouble cars, etc. PG and E had representatives from their dispatching and trouble departments who commented very favorably on the advantages of two-way radio communication. R. L. Brinton of PG and E acted as discussion leader.

Transportation Group

R. M. Middleton, sponsor

Labor-saving machine tools and devices were the subject of discussion by Eugene Howell, Sierra Pacific Power. C. R. Stanley, PG and E, led a lively discussion on design and standardization of electric utility truck bodies. He mentioned a number of requirements for bodies laid down by his operating department as influencing design. These included more clothes locker space, more rubber goods storage space, sliding steel body tops, water fountains with means for ice cooling, heat in the truck body, additional seating capacity for crew, crew compartments, lower beds and multiple-wheel drive. Design points dictated by experience included better support for floor and better facilities for raising the derrick. Stanley told how his company had standardized design and used assembly methods to cut cost in the large number of postwar bodies they have built. By making up standard parts and using jigs for assembly it has been possible to build large truck bodies with 200 man-hours and small bodies with 175 man-hours of shop labor. These figures represent large savings over the tailor-made type of body.

Dawson Jenkins

With S. B. Shaw, PG and E, as discussion leader, the subject of garage buildings was thoroughly covered. A report from Southern California Edison gave an extensive review of that utility's program looking toward the construction of a number of standard service groups. These would include office space, warehouse facilities, loading docks, truck storage space, automotive and other shops. Group arrangement will be such that any of the facilities can be expanded independently of the others, thus making for flexibility. Service groups will be located on ground plots of not less than three acres, including space for pole storage. A number of such service groups are to be built on the Edison system. Some time also was devoted to a discussion of the use of mobile cranes and other equipment at these service groups to reduce handling costs.

Business Development

E. W. Meise, chairman
J. S. C. Ross, vice-chairman

TO simplify life for the members interested in some phase of selling, the Business Development Section concentrated its activities into two general sessions, presided over by E. W. Meise, San Diego Gas & Electric Co., chairman, and J. S. C. Ross, Pacific Gas and Electric Co., vice-chairman. A program of interest to the appliance and radio industries was presented on Wednesday afternoon and a large crowd of dealers from San Francisco Bay region was invited to attend. The Thursday afternoon session was devoted to lighting, power, agricultural electrification, building modernization, and advertising.

Appropriately Miss Genevieve Callahan, home economics consultant, writer and editor, San Francisco, as the speaker on *The Simple Life, 1948* said it was her object to describe trends in living now emerging clearly on the Western home scene and how they affect the electrical industry. There were three noticeable trends:

1. Toward a simpler, more natural, more independent way of family living.
2. A more simple type of house for this Western family.
3. More simple, informal methods of entertainment in the Western home.

These trends are characterized, she said, by several noticeable factors. The kitchen, for example, is becoming more important as a living area for the family and as an entertainment area for guests. The cause is the Western homemaker's refusal to be shut off from all home activity while she is forced to work in the kitchen. She brings everyone out there with her.

Then there is the laundry. This is moving more and more into the kitchen, Miss Callahan said, for two reasons: (1) Washing clothes is now socially acceptable, so it is no disgrace to own a washing machine and a dryer. (2) The new designs in laundry appliances make them practical, from a utilitarian as well as appearance point of view in the modern kitchen.

There is a trend toward the multiple-use room. In many Western homes the living room doubles as a dining room. The master bedroom doubles as a sitting room when the youngsters take over the living room and terrace. The utility room serves, too, as a game room and a private bar.

Among the trends also is the change in decorating and design brought about to fit these other living habits, she said. Furnishings are simple, comfortable and easy to clean.

Miss Callahan presented recommendations to the appliance industry tied in to the trends which she had noted. In advertising and promoting appliances to the domestic market, she suggested that the industry: (1) think more about the whole home, rather than part of a particular room; (2) help the homemaker to make more use of the appliances in her life and to pass on more ideas which the homemaker can adapt and use as her own; (3) put more emphasis on people and what the appliances can do for them.

She suggested that in kitchen planning, the industry skip the U-shape, the L-shape kitchens, etc., and help in the planning of the YOU-shaped kitchen. (4) She said that the industry should put more emphasis on the woman IN the kitchen, rather than picture her leaving it. There is too much emphasis on kitchen escapism; (5) put more emphasis, too, on home entertainment from the women's point of view; (6) put more reality into homemaking demonstrations to women, both in advertising and floor presentations. She suggested that the woman prospect be given a chance to try every appliance, to get the feel of it, to picture herself using it in her own home; (7) Miss Callahan recommended that the industry put more depth into its entire selling job, that is, show a better understanding of the human values involved in the use of appliances.

Television, the big topic of the day, was discussed by Klaus Landsberg, West Coast director, Television Productions, and general manager of the television station KTLA in Hollywood, Calif.

Television is a new challenge to the electrical industry. Housewives will spend considerable time viewing it. Recipes over television will become popular and the modern appliances will help this medium to attract the audience.

Television has great cultural potential, said Landsberg, as it will keep those who must be at home informed of outside activities. As for programming, Los Angeles now has 48 hours of program a week. The financial end of the business is still one of investing in the future. KTLA, he said, would be out of the red in two years and two months of operation. There are now 25,000 receivers in the Los Angeles area.

For the support of the industry he compared television as an advertising media with newspapers. In Los Angeles area there are 400,000 newspaper readers of which he estimated 50,000 would remember an ad. In television there is now an estimated audience of 100,000 who rarely miss viewing the ad. Advertising is made entertaining and humorous. It draws 10 to 1 against newspapers.

Business Development Section Chairman E. W. Meise and his Wednesday speakers; J. S. C. Ross, vice-chairman, presiding later; Ben Sanderson who spoke for G. H. "Rock" Smith; Genevieve Callahan; Klaus Landsberg. Scaife entered later

Oddly Landsberg suggested dealers start calling television "radio" because, he said, it was the same thing, just an advancement such as early radio was primitive compared to present radio. Sales will become easier the more dealers know of installation, receivers, where to place the units, etc. The seller will have to face the problem of placement and installation. He urged that dealers not try to sell radio when television is introduced into an area and not try to sell television as they would radio. They must learn the technical applications.

For quality of picture he felt that television was not as satisfactory from coaxial cable as from micro-relay. The relay system from Los Angeles to San Francisco was still a year away, and transcontinentally two years. His own company, Paramount, has developed a recording process which films from Kinescope and can receive an image off the air or line. It appears in negative form. The motion picture camera is used and it is developed and put on the screen in 55 seconds after the image is received. Present legitimate stage productions are not adapted as yet for television, and television will sponsor its own sports or other events if it is not allowed in on the present events.

He belittled FM and said television was definitely the thing. The present receiver will not be superseded in five years. Mass production will reduce costs for sets and parts. Color will be slow and may not come for five, perhaps eight years. Even so, black and white will not be jumped immediately to accept color. Only 5% of the 25,000 receivers in Los Angeles, he ended, are in bars despite all the appearance to the contrary.

Impact of Frozen Foods on the Electrical Industry, a talk which G. "Rock" Smith, Deepfreeze Division, Motor Products Corp., was to have given was presented by Ben G. Sanderson, Western regional sales manager. After reciting the growth of the frozen food industry he illustrated the home freezer business growth by saying that at war's end some 400 manufacturers planned to get in the business, 185 started building some, and now there remain 55 manufacturers of which less than two dozen are a factor in the industry. A great deal of the bloom has gone off of the business and it gets down to a real selling job, was the conclusion that he drew. The public, however, are more sold on home freezers than dealers are. The cream is off the market and the industry must get back to the same two-fisted selling program that the appliance industry has used for years.

In reviewing how other appliances have been sold in the past he urged strongly that the power companies aggressively get back of this new service. He pointed out that, connected 24 hours a day, it is one of the finest loads possible to acquire.

Smith paid special tribute to the promotional effort in San Diego by the Bureau of Radio & Electrical Appliances. He reviewed the clinics and panels and the meetings held down there which had stepped-up sales in San Diego County to 130% over a like period last year. The necessity for specialty selling was next emphasized and he went into some description of various specialty selling methods.

Because the home freezer is a specialty item he urged that dealers give a specialty incentive commission to the salesmen for making the sale.

"I want you to remember these

things about the home freezer business," he concluded. "It has a great future. It's a big business today. It provides a new service for the American home that is unprecedented both in convenience, labor saving, as well as money saving. It is going to take one of the greatest educational programs that has ever been attempted in the appliance industry to get real sales volume. Put the first home freezer in your home. Be an enthusiastic user. Train your sales force completely and use every means of merchandising, display, and advertising that is available, and then sell, sell, sell!"

"Sales are made to people," was the reminder that Art Scaife, manager, advertising division, appliance and merchandise department, General Electric Co. of Bridgeport, Conn., gave to close the Wednesday session. He placed much emphasis on brand preference. Although this had broken down during the war when people had to buy what was available and not what they wanted, the appearance of much junk soon began to make people realize the value and the quality and place their reliance on products of well-known companies. As a result, he said, the consuming public is more conscious of brand today than ever before in the industry's history. This trend was noticeable even in the food industry where several large super-market chains are shifting to national brands and dropping private brands.

Scaife's talk was essentially the same as that given last year at the San Diego Bureau of Radio & Electrical Appliances and dealt largely with the human aspects of selling to people.

A different approach to the farm electrification program in California was advocated by George A. Rietz, manager, farm industry division, General Electric Co., Schenectady, and president of the American Society of Agricultural Engineers. "Don't let the big loads from irrigation crowd your thinking of the farm market," he advised. He urged that the industry try to understand the needs of the farmer rather than concentrating on its own needs in the rural areas. Thus in building load in the farm areas an effort should be made first to sell all the known and proved farm appliances before trying to promote sales of newly developed products. He advised balancing farm load by encouraging the purchase of a full compliment of household electric equipment and other small uses of electricity.

A utility should humanize its sales story to farm families, he said, try to talk their language in terms of electricity and farm life. More use should be made of farm organization meetings for the presentation of the electrical story, with entertainment for farm families as a drawing card.

Rietz

McKibbin

Gerber

He set-up five steps to sound progress in farm electrification, involving research, engineering, manufacturing, sales, and profit to farm families.

Although advertising executives are considered to be chiefly concerned with advertising, J. M. McKibbin, assistant to the vice-president of Westinghouse Electric Corp., Pittsburgh, Pa., proved that a knowledge of the entire industry and its future is an important factor in planning its advertising and sales promotion. Because the American public will use in the next ten years as much electric current in one day as it did in six months early in the century, generating capacity will have to be increased about 95,000,000 kw., about 80% over present installed capacity. These increased uses will come through better living, more use of appliances, lighting, television, home heating, air conditioning, as well as a 20% increase in residential customers. It all should result in a 72% increase in use of the residential electricity.

Farm demand will increase sharply in the next decade as service is extended to nine farm families out of every ten in the country, an increase of 42%.

But the biggest part will come from electrification in all industries to improve productivity. There will be more substitution of electricity for man's labor.

America is the world's biggest producer, McKibbin said, reciting a number of statistics to show the percentage of ownership of automobiles, insurance, radio sets, power, etc. With such use of the facilities of industry it was hard to understand why there was so much unrest. This unrest, he said, presented business its greatest challenge today. If it can meet it then the future holds for the country even greater progress than has been made in the past. Chief cause of dissatisfaction is the desire of each individual to feel himself an important part of the united whole, said McKibbin. The desire of each individual to feel that he is a partner rather than a part, that he is a man rather than a tool, that he is a person rather than a product.

He urged understanding of this need and finding means of communicating the attitude from the top down. Employers should direct their most powerful efforts towards improved employee relations and recruit adequate manpower for the job ahead.

"I'll hazard the opinion," he declared, "that the company head who spends time getting to know and understand even a fraction of the men in his plant will present a better balance sheet over the years and will find a way to create that unity in our industrial life which is going to be an essential ingredient in our continued prosperity."

How electricity is entering more into commercial and industrial usage was explained in considerable technical detail by Harold L. Gerber, electrical engineer, A. A. Coddington & Co., and former chief inspector, San

Francisco. Gerber explained that in modernization of commercial buildings, both in new and in existing installations, the engineer is provided with many new ideas, new code rules, new materials with which he can plan and produce installations of greater efficiency and at less cost than previously, even at present-day increases in cost of both labor and materials. As much of Gerber's talk was technical and provides definite working information for contractors, engineers, and sales personnel, it will be reproduced later in more detail.

He explained how the 1947 edition of the code permitted many new techniques which would make power supply for modern needs available more conveniently, discussed rewiring for modernization, the importance of voltage maintenance with fluorescent lighting especially, radiant heating systems, the installation of high-voltage conductors into the centers of distribution in a building, capacitors for power factor improvement, etc. Many of his remarks were extemporaneous however, and he ended by predicting loads in the future which will tax even the imagination of the utilities to supply, let alone their generating facilities.

Light, the first electric service offered to the public, was the subject of the last talk on the Thursday program. George M. Rankin, director of lighting, So. Calif. Ed. Co., reviewed with good humor some of the history of lighting and of merchandising from the days of the bazaars to the present. Then, as now, the gyp operated in poor illumination to hide the defects of his merchandise, whereas the honest merchant provided plenty of illumination as an aid to selling the quality of his wares.

Rankin discussed many of the trends in illumination since the advent of fluorescent lighting and made a significant remark that in southern California more than 70% of all retail stores have a frontage of less than 25 ft. This made them a long single aisle and most of them are very badly illuminated by a single row of fixtures down the middle. He then described the various areas that need illumination and how they should be treated.

His concluding remarks were particularly pertinent. To the contractors he advised that the utilities maintain staffs of lighting men, many of them graduate electrical engineers, who specialize in the application of light to commercial and industrial occupancies. These men are conversant with new developments in lighting design and application. "They are at your service at any time and all that is usually necessary is to call the nearest office of your power company and make an appointment. They will be happy to work with you on any of your lighting problems.

"This service is entirely without cost to you. These men have no merchandise or equipment to sell and in consequence can give you or your clients information and advice that is entirely unbiased. They are not tied down to any one manufacturer's brand, and their experience with all the available equipment makes it possible for them to recommend the best methods, materials and equipment for the conditions involved in each individual case."

To utility executives he urged that, despite the current shortages of power, the lighting and promotion activity should be sustained and expanded. The men should be carefully selected and well trained. They should be paid on a scale commensurate with the results they produce. They make from 70 to 120 calls a month and therefore keep in close touch with commercial accounts. They eliminate sources of complaint and smooth out difficulties. The load they promote is the most desirable. It costs the least to sell and the least to serve, and it earns a very excellent rate of return.

Administrative Services

G. M. Henderson, chairman
J. K. Uhler Jr., vice-chairman

SINCE Administrative Services include several divergent groups whose functions relate to the operation of the "overhead" of the utility business and to handling its money, it was natural that this section divide into its various functional groups for consideration of each one's particular group of problems. There was no general meeting of the entire section.

Purchasing Stores Group

William deWaard, sponsor

J. Lester Perry, president of Columbia Steel Co., presented the purchasing and stores group at its opening session with an intimate picture of the steel situation, particularly in the West. S. R. Robinson, San Diego G&E, presided.

The steel capacity of the West has increased to 2,700,000 net tons annually as compared to 900,000 net tons before the war, a greater percentage of growth than any other region in the country. Despite this situation, many complex problems have confronted the industry which have made steel hard to get in quantities sufficient for expanding industry.

Rankin

Many important decisions hang in the balance, he said. "For example, who among us dares predict today what the government is going to do with our money; what the government's final policy will be with regard to our rearmament program; or the actual amount of steel and other materials that will be sent abroad in the future to meet the European Recovery Program requirements?" He felt the impact would not be as great as might be indicated at first glance, because the industry is already shipping somewhat in the neighborhood of 13,000,000 tons to these same groups for the same purposes.

As a sidelight on the effect of such a thing on steel production as the recent coal strike, he said the loss of steel due to the recent strike would run to about 1,614,500 tons. "That's a lot of steel in any manufacturers' language," he said. "Add this loss to other losses resulting from strikes and work stoppages since the end of World War II and we have come out with a total of about 20,000,000 tons of ingots that have been denied to the trade." He also mentioned the U. S. Steel Co.'s attempt to hold down costs of living by reduction of steel prices and a refusal of wage increases to steel workers that would increase prices again.

Following Perry's talk, R. E. Mackersie, PG and E, led a discussion which brought out these answers.

The steel situation is improving. By the end of the year the industry expects to produce at least 95,000,000 tons. There will be a shortage of pipe which may be accentuated by the ERP. It will be worse if another coal strike is called.

Copper situation is good. Supply

will be adequate unless the ERP takes too much. It is estimated it will take 10% of production.

As to electric equipment, power transformers are okay, switchgear is delayed by lack of insulators, distribution transformers and lighting equipment are okay, watt-hour and demand meters are catching up with the requirements and may be okay by the end of the year.

As to insulators, pin-type distribution are being delivered now. However, suspension type are taking 105 weeks for delivery and pillar type 105 weeks.

What the effect of the Supreme Court ruling on multiple basing point system pricing will have on availability of materials was still a question. Present price reductions in steel were not felt to be indicative of a deflation.

The recent walk-out of soft coal miners brought out the point that coal stockpiling is negligible and the supply is in bad shape. Production of steel products will be greatly curtailed if the coal miners strike.

The Thursday session was started by a report on material inventory control by R. E. Fritzer, San Diego G-E. J. K. Uhler Jr., presided. Fritzer's report covered the subject quite thoroughly and drew these conclusions. To insure an adequate inventory control (1) a perpetual material record indicating complete description of the material, quantities on hand, quantities on order, and average consumption figures should be maintained. (2) A well-controled and supervised system of ordering by experienced and qualified personnel is necessary. (3) Accurate information regarding proposed construction projects as to quantity of materials required and required delivery dates is important. (4) Standardization of construction design and simplification of stores stocks is imperative. (5) Constant effort to dispose of obsolete material should be maintained. (6) Cooperation and coordination among the purchasing and using departments would be very beneficial. (7) A well-defined purchasing policy is imperative.

Purchasing & Stores group discussing inventory control, with B. D. Haugh at rostrum; J. K. Uhler Jr., presiding; Roy Fritzer, paper presenter in the front row, and Bill de Waard, group sponsor, seated at the rear, right of table

B. D. Haugh, So. Calif. Ed., led a discussion, item-by-item, on the subject. An interesting question he asked was whether any other companies were using wire recorders for taking inventory. His company has been experimenting along that line. It saves time and detail work.

De Waard in closing urged younger men to be more active in the association and asked that more work be done on the important problem of standardization.

Accounting Group

C. B. Bradshaw, sponsor

Led off with papers by C. W. DeVoe, San Diego Gas & Electric Co., on *Construction in Direct Costs*, and G. C. Dakin, Coast Counties Gas & Electric Co., on *General Administrative Expense*, the accounting group meeting developed into informal discussion of methods. There was good audience participation; in fact the group ran out of time and a questionnaire was passed around to determine whether separate sessions should be held on various topics under the general heading of accounting. Although all utility methods basically are supposed to be the same, it was found that the means of arriving at the answers are different in the different companies. The interchange of information was felt to have been extremely valuable.

The first afternoon session was particularly interested in a presentation by A. W. Uhrich, PG and E, who described the problems and the methods of handling mass payments, such as stockholders checks where there are several classes of stock and a difference in dividend rates and a very large number of individual stockholders. The various machine methods of accounting were described in some detail and the application of these machines to the process was interesting to the group.

P. C. Hale, So. Calif. Ed., acted as co-sponsor and brought forth a number of questions which were discussed at length. Machine methods in accounting were declared to be not foolproof. However they do save time and man-hours and money. The breakdowns that they have and the necessity for well-trained personnel to handle the machines accurately was emphasized. The reaction of the recipients to machine-made checks was also discussed.

The Thursday session was livened by a panel discussion, *How to Qualify as a Depreciation Expert in One Easy Lesson*, in which E. L. Sheppard, Calif. Elec. Power; B. A. Morse, So. Calif. Ed.; J. F. Brennan, PG and E; and R. K. Corwin, Coast Counties G&E, participated.

M. Lloyd Rugless closed the meeting with a paper *Procedure for Closing General Books for the Preparation of Monthly and Annual Statements.*

A. W. Uhrich explains the machine-made checks for stockholders' dividends at Accounting group session, as P. C. Hale, discussion leader, holds the display

why 3 kinds of lamps for street lighting ?

Here we have endeavored to answer the question we are frequently asked — "Should we use incandescent, mercury, or sodium lighting?"

The answer is specific in some cases. It is necessarily broad in others. But, with full facts, a concrete answer can be given for any particular job.

We are the major supplier of luminaires for *each* of these three light sources. This places us, we believe, in a unique position to give you unbiased advice.

General Electric Company, Schenectady 5, N.Y.

Incandescent

For most lighting—where a 6000-lumen lamp is the largest used—incandescent is the only practical system.

Incandescent lighting's place is roughly this: ***Residential,*** with generally the smaller sized lamps. ***Traffic and secondary business streets,*** with medium sized lamps. Finally, ***main traffic arteries*** and primary business district, with lamps of

Sodium

Sodium lighting has an unchallenged but limited place. For some uses, its distinctive yellow color is a "must". Its low operating cost admirably suits it to others—*providing color is not a factor.*

Typical applications are: One or two luminaires to light grade crossings, abutments, dangerous intersections. An installation to mark a through-way—or

Mercury

The mercury lamp, newest of the three light sources, definitely has its place. But, unlike the others, it has no field particularly its own.

The basic point in applying mercury is that the smallest economical lamp produces 10,000 lumens. So mercury's big field is definitely in high-level lighting.

Its big advantage is efficiency—double that of incandescents. Its color—a cool,

10,000, 15,000, even 25,000 lumens.

For this high-level lighting, both incandescent and mercury have advantages: The much lower lamp cost and the lower investment for incandescent systems *may* outweigh the high efficiency of mercury. The conventional color may be preferable.

But—in the higher levels and special applications, new light sources do definitely compete, and in these you should always make individual comparisons.

East Erie Ave., Lorain, Ohio. G-E Form 79R luminaires with 6000-lumen incandescent lamps.

turn-offs to a tunnel, bridge or express route. And finally, bridges and highways in general—but *only* after a comparison of operating costs.

Sodium lamps have an efficiency 2¾ times that of incandescent. Their 4000 hour life (8000 on continuous burning) cuts servicing costs, makes annual lamp cost on a par with incandescents.

So—sodium lighting, where it can be used, is tops.

G-E sodium-vapor luminaires on the Charter Oak Bridge, Hartford, Conn.

crisp blue-green—makes it especially appropriate for white ways. When vertically burned lamps are used, many modern incandescent-type luminaires, with proper ballasts, give maximum utilization efficiency, and maximum visibility. Mercury's one disadvantage is high lamp cost, which is partially overcome by long lamp life.

Summing up: Mercury must usually be "proved in"—but, more often than not, will prove economical for higher intensity installations.

Looking west on First Ave., Spokane, Wash. G-E Form 101D luminaires with 16,000-lumen mercury lamps.

GENERAL ELECTRIC

Credit and Collection Group

K. L. Boosey, sponsor

As an index of the change from flush to famine, perhaps, the credit and collection group found the two sessions all too short a time for exchange of ideas and methods for tightening the noose on bad credits and deadbeats. In addition to prepared discussions on several subjects, the group conducted something new, a "Problem Buster Clinic," in which anyone could ask any question about any credit and collection problem and get the benefit of others' experience. Three main topics emerged in these clinics:

1. Collection of past-due bills in commercial accounts where the bill is less than the meter deposit.

Credit and Collections group discussing deadbeats. E. J. Wright at head table with K. L. Boosey, sponsor, told of the turnover in small businesses recently

2. Necessity for a corporation to establish credit in spite of the good credit risk of each of its officers.

3. The new driver's responsibilty law and problems involved.

It was developed that the number of past-due accounts is increasing at a rate that is somewhat alarming. The rate used to be less than 4% and has grown to 20%. Hence all the credit and collection people were eager for what others were doing to meet the situation.

C. L. Noland, So. Calif. Ed. Co., discussed refunding or holding the commercial, industrial and agricultural deposits. The question was whether to avoid interest payments by refunding or to hold the deposits because of a danger of poor payment. A committee is working on unification of rules throughout California in order that a similar policy may be followed by various companies.

E. J. Wright, San Diego G&E Co., presented an interesting paper on obtaining credit information or deposits from small businesses, so many of which are changing hands. From 190,000 licensed businesses in the state of California in 1941 the number has grown to 275,000. In San Diego, which has only 5% of the total, the retail outlets increased from 11,000 to 12,000 during 1947 and there was a change in ownership in almost one-half of them. The figures for San Francisco are 32 out of 100, the lowest in the state. He said this turnover was general in the West and tried to analyze the reasons for it. Beside sickness, which normally would cause change of ownership, many who entered business seem to be leaving it. Others are finding their experiences limited and, since they now have to tie up what little working capital they have in time payment plans, it forces the general slowing up of payments to their creditors. Smart ones who noticed the condition are making an effort to sell out before it is too late.

He advocated use of information from the sales tax permits by the State Board of Equalization and also spoke of the bulk sales law in California and in many states, and its usefulness in determining credit ratings. His suggestion for a remedy for poor credit risks was to require a deposit, saying that the interest paid on deposits for small businesses would amount to less than the cost of trade reports and follow-ups and losses from bad accounts.

Clarence Hughett, PG and E, discussed the subject of extending credit on agricultural accounts and brought forth the need for similar investigation before too extensive credit granting.

Earl T. Crick, Coast Counties G&E, spoke of the problem of establishing responsibility and collecting accrued bills in cases of divorce, separation, and separate maintenance. He said it was necessary to follow out the legal and technical phases of such a situation very closely. In fact all discussion led to the realization of a need for considerable legal knowledge on the part of credit and collection men.

John Fox, So. Calif. Ed., led discussion on collection action on closing bills and it was brought forth that many companies are forwarding uncollected bills to a central clearing house. Opinion was divided, however, as to the value of this procedure.

C. S. Manwell, PG and E, discussed the value of credit information as an aid to collection. Because utility accounts differ in many respects from ordinary commercial accounts and because of state regulations, various sources of credit information are not always of value in time enough to be used. Much discussion ensued over alternate means of getting credit information and collecting procedures. All companies seem to be leaning toward credit information, especially age of accounts and open accounts.

Personnel Group

A. J. Noia, sponsor
C. H. Warner, co-sponsor

Importance of a well-defined and consistent system for evaluating supervisory and administrative salaries was brought out in talks by H. M. McKnight, PG and E, and F. E. Avery, Southern California Edison. Both men stressed the fact that evaluation methods are merely useful tools; both based their remarks on the assumption that the over-all salary picture in a given company is correct, and that the problem is to ferret out inequities. It was not suggested that common sense and good judgment could be displaced by "some magic measuring instrument."

Recognizing that today's specialization brings the necessity for evaluating one specialized line of work to all other jobs, some technical, some supervisory, McKnight and his associates have worked out a plan for salary alignment in the intermediate zone between the bargaining unit and executive levels. In the utility industries, about 15 out of 100 employees work in this intermediate area between $300-350 and $900 per month. Five or six of the 15 are first-line supervisors with compensation fairly well fixed; the others are administrators, engineers, lawyers, investigators, specialists, technicians.

With the architecture of the present salary scale determined by plotting salary against percentile rank, McKnight strove to develop an evaluating method which would combine the advantages of the two basic approaches, point evaluation and factor comparison. By that he meant one patterned after the point system, with its many factors, but making use of factor comparison in determining degree into which a particular job attribute falls.

After about 17 job attributes, or factors, were tested, nine were selected:

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New economies in first costs: because weatherproof wire with Alcoa E.C.* Aluminum conductor gives you lighter weight and lower cost with equal conductivity. The lighter weight in stringing and handling means economical installation—lower transportation costs.

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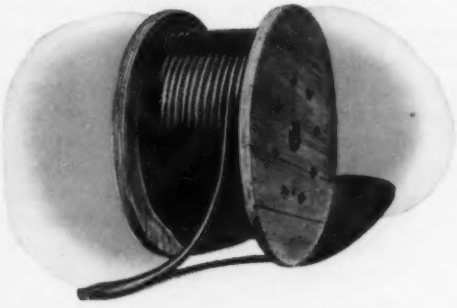
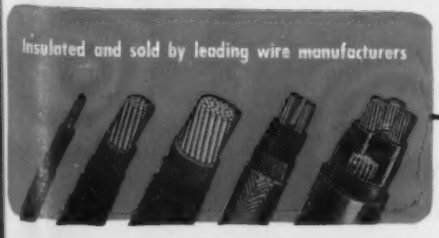


YOUR SUPPLIER HAS IT!



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education, experience, complexity of duties, cooperation and contact, supervision received, responsibility for decision, determination of procedure and policies, supervision of others, executive functions.

Before such a plan can be used, McKnight pointed out, it must be weighted, given a statistical test, reanalyzed, if necessary. Since you are measuring with words, there should be no doubt about what is meant, he warned, adding: "Remember your final objective is simple consistency, you are seeking a means of measuring all jobs by the same standards." Techniques of formal evaluation are to systemize judgment and minimize the errors of judgment by refining the process of camparison, he concluded.

To free itself for sufficient uninterrupted attention to future objectives and action, management must (1) devise and maintain a sound plan of organization, (2) develop fully qualified personnel in all key positions, (3) institute effective means of control. According to Avery, a consideration of these three prerequisites to good management is involved in evaluation of supervisory and administrative positions and consistent compensation of such personnel.

Interest in the mechanics of the program must not detract from the fact that we are dealing in the formation of procedure to guide decisions as they affect people, not in the formulation of procedure for the sake of procedure, he warned. First, human beings feel most at ease, experience less friction and irritation in an environment of consistency, he pointed out. Second, people want to know what to expect. Salary not only feeds and cares for the family; it is also the yardstick for measuring that unspoken question: "Compared with my associates, how am I doing?"

The salary plan should be successful, according to Avery, if it is so formulated and administered that it is consistent in application, comparatively easy to administer and understand, provides flexibility, gives a basis for control and regular appraisal, meets the needs of the situation and provides incentive and reward.

"Management must stand in the first line of offense in the battle for the American enterprise system," Avery concluded. It must portray its confidence, show it knows its obligations and is moving to meet them, protect itself from attack and be as free from human error as possible. "Systematic salary administration is one of the tools by which management can act with justification and justify its actions."

Effect of the employee on public relations was discussed by a panel of industry members. Left to right are C. H. Warner, co-sponsor, and A. J. Noia, sponsor, of the personnel group; panel members, J. H. Mead, Walter G. Willson, Moderator A. L. Laws, Kenneth Van Gundy and F. Lowell Garrison

Developing a sense of belonging and a desire to contribute probably is the most difficult and widely needed phase of all employee training today, in the opinion of G. B. Stone, training supervisor of the Union Oil Co.'s Oleum refinery, who spoke on development of the supervisory training program.

In its own program at Oleum, Union Oil went direct to the supervisors to find out what they needed for the successful execution of their duties. From replies, a program was set up to give information on: the labor contract; the company's various employee benefit plans; the company and its operations. A comprehensive handbook of data was provided.

Supplementing this information, the company held a series of meetings of a foremen and engineers management committee and another series of meetings covering all employees at every level. During these meetings, the company's operations, profits, organization and history were covered, as well as the workings of the free enterprise system.

Employee response to the program was favorable, Stone said, and over-all efficiency was greatly increased.

Employee polls have been rediscovered recently and, while we are perhaps overenthusiastic about them at present, they are a valuable tool, according to Dr. Dwight Palmer, Los Angeles consultant. The wrong way to go about it, he said, is to decide at lunch to conduct a poll, to get questions on the run, make no attempt to iron out the bugs, neglect to bring in the supervisors, start working on it before studying it.

The right way is to make sure what the company wants to do; to get sound professional advice in and outside the organization; select the people covered with care; analyze results; take care not to jump the gun and deduce things it would be difficult to prove. And it isn't finished with until action has been taken in light of what the poll shows, he pointed out.

Some of the reasons for polls listed by Palmer: (1) employee wants to feel he belongs, to be considered; (2) management feels isolated, out of touch; (3) evidence of employer good will; (4) public feels polls are good, idea of people getting chance to be heard rings true to American ideal.

If you poll the union and not other employees, you are asking for trouble and probably are going to get it, Palmer said. Supervisors also are important. Questions should be unbiased, well-defined, non-discriminatory. The sample should be sufficiently large. The answers should be looked at with rigor and broken down to get to the specific.

"Don't think an opinion poll is going to decide everything," Palmer advised. If questions aren't right, answers won't be helpful; if sample wrong, results will be in error. "And if action is indicated, don't procrastinate. Do it now," he urged. If a company is not prepared to do any sensible thing asked, it is better not to conduct the poll, he declared.

That the industry in this area is well aware of the effect of the employee on public relations and the necessity of keeping him informed of company policy was evidenced in the panel discussion which closed the group session. Constructive programs were outlined by all members of the panel, which included: Kenneth Van Gundy, PG and E; F. Lowell Garrison, G-E Supply; Walter G. Willson, Westinghouse; J. H. Mead, Southern California Edison; A. L. Laws, Southern California Edison, moderator.

How Rome Type RH BUILDING WIRE can save you more money on feeder circuits

WHERE VOLTAGE DROP IS NOT A PROBLEM you can realize actual dollar savings by using "Rome" Type RH (Heat Resistant) Building Wire for industrial feeder circuits. Here's how.

As compared to all other types of Building Wires, National Electrical Code current carrying capacities for Type RH, permit, for equal amperages, the use of smaller conductor sizes in nearly every instance. Here is a first and real saving in cable cost. Further, smaller conductors mean smaller conduit and fittings, or more circuits per conduit . . . both ways, an additional saving.

This is to say nothing of the ease of handling and dependable quality which always mean low cost installation when you specify "Rome" Type RH Building Wire.

FIGURE IT FOR YOURSELF:

1947 N.E.C. Allowable Current Carrying Capacities in Amperes Based on Room Temperature of 30° C (86° F).

Size AWG or MCM	*Not more than 3 Conductors in raceway or cable*		*Size AWG or MCM*	*Not more than 3 Conductors in raceway or cable*	
	Types R, RW, or TW (3-4/0)	*Type RH*		*Types R, RW, or TW (3-4/0)*	*Type RH*
3	80	100	300	240	285
2	95	115	350	260	310
1	110	130	400	280	335
0	125	150	500	320	380
00	145	175	600	355	420
000	165	200	700	385	460
0000	195	230	750	400	475
250	215	255			

EXAMPLE:

Required Amperes	*Permissible Size*		*Approx. Percent. Saving in Cable Cost*
	Type R	*Type RH*	
130 Amp.	2/0 AWG	1 AWG	26%
200 Amp.	250,000 CM	3/0 AWG	24%
300 Amp.	500,000 CM	350,000 CM	18%

To Save Feeder Circuit Costs . . . Specify "Rome" Type RH

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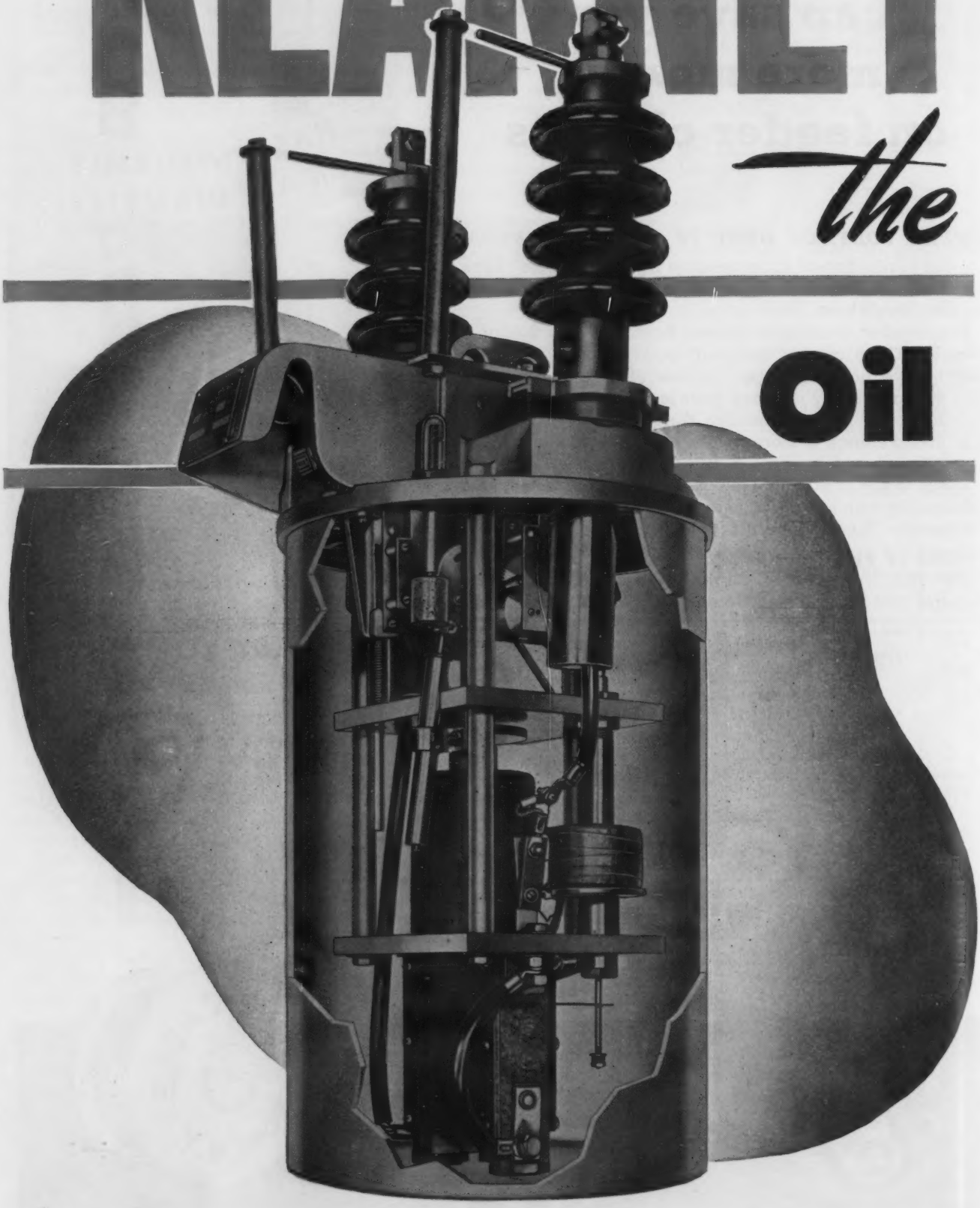

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Wholesalers Concerned With Credit

CREDIT is becoming a matter of more concern to wholesalers. So is assistance in speciality selling. Whittled down profit margins exert a counter pressure.

These and the power situation, industry interdependence, the replacement market for appliances, made up the program for the Pacific Zone Convention of the National Electrical Wholesalers Assn. at Sonoma Mission Inn, June 2, 3, and 4. E. E. Karsten, Gough Industries Inc., Los Angeles, zone chairman, presided and R. A. Balzari, secretary, handled arrangements as well as reading the paper, *Problems of a Small Wholesaler*, by George P. Davis, general manager, Lorenz Co., Portland. The latter was prevented from attending by floods.

The credit situation was discussed by A. D. Johnson, secretary-manager, Los Angeles Credit Men's Assn., who advocated good organization and managements of wholesale credit departments. There should be critical examination of any dealer's credit on a basis of "life expectancy of the account." There should be personal contact between retailer and the wholesaler's credit man in order to analyze the strength and weaknesses of the relationship. There should be recurring examinations to keep credit accounts healthy. There should also be a clinic where the dealer can be helped for minor credit ills.

The ideal credit man should be a good judge of human nature, know the principals and practices of retailing, be an accountant and be sales-minded.

Earl Germaine, sales manager, Bendix Division, Leo J. Meyberg Co., Los Angeles, re-emphasized the necessity for training specialty salesmen, something of a lost art at the present time. Dealers must be coached to ex-

Chairman E. E. Karsten

pend more effort on planned selling, to develop visual merchandising, to improve closing at point of sale. With the demand for appliances easing up with the greater supply, a return to specialty selling methods is imperative, he inferred.

Charles G. Pyle, managing director of NEWA, brought back some of the human fundamentals of the business of wholesaling. Every employee must believe in himself, the company he works for, and the industry of which he is a part. Thus he can become a voluntary salesman selling everyone on the value of the electrical industry and its products.

The small wholesaler, said George P. Davis, is under pressure by manufacturer and customer alike for extra services which cut down his profit margin. Manufacturers, he said, could help by better packaging which has more practical and complete descriptions. More advertising to keep goods sold is also important from the manufacturer, he said. Small wholesalers, on the other hand, can help by buying in more efficient amounts, cataloging products that he handles, and making use of the sales materials that manufacturers furnish. Then he must beat the bushes and not just shake the trees in his own neighborhood to develop all the business possible.

The power shortage situation is not confined to California and the Northwest, O. R. Doerr, vice-president, Pacific Gas and Electric Co., told the meeting. Over 75% of the nation's utilities have less than adequate capacities. He then outlined the company's building program to relieve the situation by winter.

Howard J. Emerson gave essentially the same talk that he had given to the Victoria meeting of the Northwest Electric Light & Power Assn. on the replacement market for appliances. This paper will later be reproduced in more detail.

A surprise feature of the entertainment program, introduced at a cocktail party by the lamp department of General Electric Co., was the first broadcast of a new series, "What's My Name," direct by wire from Hollywood. Ray Turnbull, vice-president, General Electric Co., introduced the program and discussed it briefly.

The convention committee was headed by E. E. Buerkel, Incandescent Supply Co., as chairman; D. A. Smith, Graham-Reynolds Co.; F. C. Todt, General Electric Supply Corp. Program was arranged by Louis G. Berger, Westinghouse Electric Supply Corp., chairman; L. E. Starkweather, Leo J. Meyberg Co., and H. E. Perl, State Electric Supply. E. A. Phillips and J. E. Bisset handled arrangements for the golf and S. B. Gregory and A. W. Rockwell the social stag. Attendence was 210 wholesalers, manufacturers and guests from eleven Western States.

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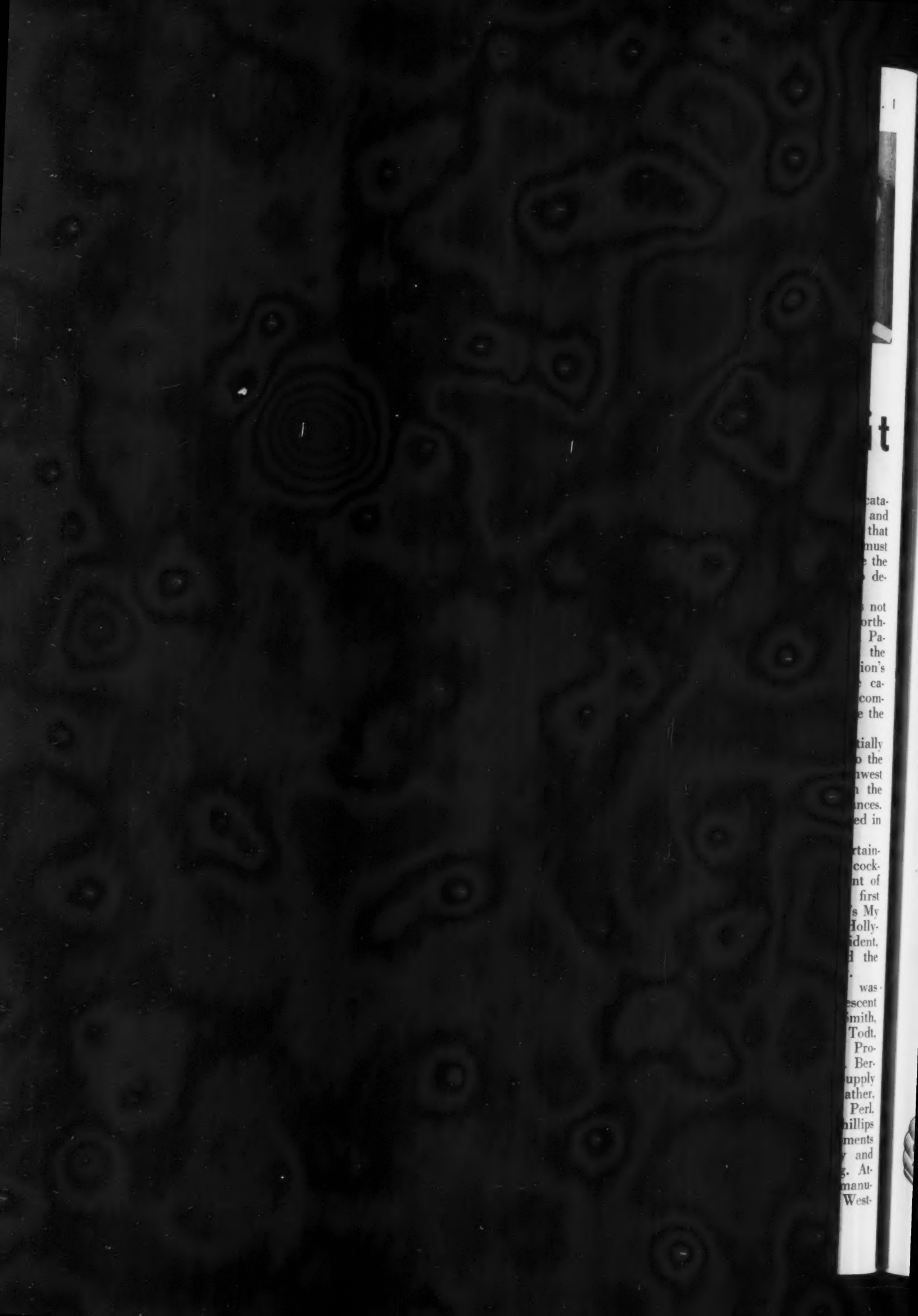

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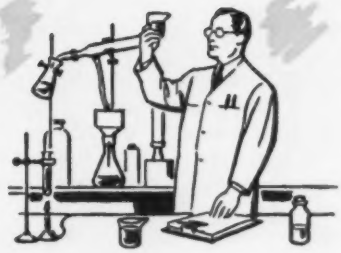

Likely you've seen what happens—how ordinary oils oxidize, break down into sludge, "gum up the works" —even cause rust. Result: shorter running time and higher operating costs.

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Shell Research specifically developed an oil for turbine use—Shell Turbo Oil. To build this oil, Shell selects only crude stocks naturally high in oxidation stability—sludge resistance. Then, with Shell-developed additives, Shell Turbo Oil is doubly fortified. Once to build up its naturally high resistance to oxidation. Again to assure exceptional rust-preventing quality.

What you as a Shell Turbo user can expect

Little or no trace of sludge, no rust, no breakdown in the oil. In fact, Shell Turbo Oil has been delivering exactly that kind of lubrication performance in all types of installations—and always to the end of extending the running time of turbines.

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THE MONTH IN BRIEF

Mountain to Mahomet

Bringing the stockholders' meeting to the stockholders. instead of the customary vice-versa, was what General Electric Co. did in two separate and packed meetings in San Francisco last month. Vice-President Ray Turnbull welcomed the owners of the business who attended eagerly, and then the annual report was presented to them graphically and effectively by means of a motion picture. The company's financial affairs were thus translated into the actual physical operations of the company in a way to be understood by everyone. There is no mystery to the capitalistic system when its functioning can be seen in its dynamic action.

Seattle Indictment Declared Insufficient

Seattle Electrical Contractors Assn. was lifted from the cloud of an anti-trust indictment by the U. S. District Court in Seattle, June 17. In lifting the indictment, Judge Lloyd Black declared that the charges made by the Department of Justice were not included in the too broad and generalized indictment brought by the Grand Jury nor was there any indication in it that what the defendants were charged with had affected interstate commerce. The San Francisco decision of Judge Yankwich was cited as a ruling as to the intrastate status of electrical contracting even though the charges brought in the indictment were much more detailed than those in the Seattle case. Meanwhile the "hunting expedition" which the Department of Justice conducted in the San Francisco bay area seeking again to present charges to a grand jury was slowed down when attorneys for the contractors went before the court to petition that if any acts were in violation they would willingly be changed.

Rainier PUD Proposed

A petition for creation of a PUD within the municipal boundaries of Rainier, Ore., has been filed with the Oregon State Hydroelectric Commission. The population of the area involved is estimated at more than 1,660 and assess property valuation is placed at $628,570.

Green Light On Merwin Addition

Pacific Power & Light has received FPC authorization for a second 50,000-kw. generator at Merwin Dam (E WEST, December, p. 112), with provision that the unit be completed within two years. The commission order stated that the proposed addition is "needed to supply present deficiences in generating capacity" in the Northwest; added that the additional capacity "would be valuable in easing the tight power situation in the Pacific Northwest power pool." Located on the Lewis River, Merwin project (formerly Ariel Dam) was built under a federal license issued in 1929.

State Controls Urged

Appearing before the Association of Washington Cities in a recent meeting in Spokane, Mayor William F. Devin of Seattle voiced a strong stand for transferring to the states the federal government's control of public power projects within their borders. "Hydroelectric power is our greatest asset" the Mayor declared. "But development of our tremendous resources in this line is now dependent on federal authorities. It's high time this state be permitted to set up a commission or authority to plan and operate power developments to insure an ample supply and distribution of facilities throughout the state on a fair basis to all sections," he said.

PUD Loses Election

Proposal of Union County PUD to acquire California Pacific Power properties in Elgin and Island City, Ore., was defeated by a vote of 221 to 162, in recent election.

PP&L Given Portland Franchise

By a 5-to-1 margin, Portland voters approved a city ordinance granting a 20-year franchise to Pacific Power & Light Co. The franchise is subject to city right to purchase at any time. Pacific had been operating under a temporary permit, since consolidation with Northwestern Electric Co. last year. Provision for operation of a central heating plant supplying steam to the Portland business area is included in the franchise.

PG and E's Kern Plant in Operation

Adding 101,000 hp. to the Pacific Gas and Electric system, Kern steam plant near Bakersfield, Calif., went into operation recently. A second unit to be installed at Kern will bring plant capacity to 235,000 hp. The initial unit at Kern is the first of 525,000 hp. to be added by PG and E during the next ten months, which will see the completion of two hydro plants on the Mokelumne River and two new units at Station P steam plant.

Increased Capitalization Approved

San Diego Gas & Electric has received stockholder approval of a plan to increase capital from 750,000 to 2,000,000 shares of preferred stock and from 2,000,000 to 6,000,000 shares of common. No immediate issue is contemplated.

Redondo Plant Dedicated

Too great dependence upon hydroelectric power was held responsible in part for the recent power crisis in northern California by William C. Mullendore, president of the Southern California Edison Co., in a speech dedicating the company's $38,000,000 Redondo Beach steam plant recently. "We have learned that it is not safe to become dependent solely upon water power, even from such a source as huge reservoirs on the Colorado River or in such a normally wet climate as northern California," he said. Two of four 66,000-kw. generating units are now in service at Redondo plant. Full capacity of 264,000 kw. is expected by 1950.

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All brushes are equipped with standard shunts. Get our complete list of standard Superior grades which can be ordered by code number.

Size—Inches L.	W.	T.	Stock Numbers Grade 440	Grade 460
1½	1	¼	A00	B00
1½	1	⅜	A01	B01
1½	1	½	A02	B02
1½	1	⅝	A03	B03
1½	1¼	¼	A04	B04
1½	1¼	⅜	A05	B05
1½	1¼	½	A06	B06
1½	1¼	⅝	A07	B07
1½	1½	¼	A08	B08
1½	1½	⅜	A09	B09
1½	1½	½	A10	B10
1½	1½	⅝	A11	B11
2	1	⅜	A12	B12
2	1	½	A13	B13
2	1	⅝	A14	B14
2	1	¾	A15	B15
2	1¼	⅜	A16	B16
2	1¼	½	A17	B17
2	1¼	⅝	A18	B18
2	1¼	¾	A19	B19
2	1½	⅜	A20	B20
2	1½	½	A21	B21
2	1½	⅝	A22	B22
2	1½	¾	A23	B23

(NOTE: Grade 440 is Carbon Graphite) (NOTE: Grade 460 is Electrographitic.)

Size—Inches L.	W.	T.	Stock Numbers Grade 440	Grade 460
2	1¾	⅜	A24	B24
2	1¾	½	A25	B25
2	1¾	⅝	A26	B26
2	1¾	¾	A27	B27
2½	1	⅜	A28	B28
2½	1	½	A29	B29
2½	1	⅝	A30	B30
2½	1	¾	A31	B31
2½	1¼	⅜	A32	B32
2½	1¼	½	A33	B33
2½	1¼	⅝	A34	B34
2½	1¼	¾	A35	B35
2½	1½	⅜	A36	B36
2½	1½	½	A37	B37
2½	1½	⅝	A38	B38
2½	1½	¾	A39	B39
2½	1¾	⅜	A40	B40
2½	1¾	½	A41	B41
2½	1¾	⅝	A42	B42
2½	1¾	¾	A43	B43

(NOTE: Grade 440 is Carbon Graphite) (NOTE: Grade 460 is Electrographitic)

NOTE — ¼" and ⅜" thick brushes supplied with 3/16" open terminals — other ¼" open terminals.

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THIS MONTH'S NEWS

Vacation Showdown Threatens Strike

Status of the "vacation with pay" program in the Oakland and Contra Costa County area between the International Brotherhood of Electrical Workers locals No. 595 and 302, is more muddled than ever. With negotiations for a new contract between these unions and the Alameda and Contra Costa branches of Northern California Chapter, National Electrical Contractors Assn., stalemated as this issue goes to press, the situation which has kept labor relations in a constant uproar all year is far from clear.

After the contractors groups and the unions failed to find any way in which a pooled vacation plan could be operated within the laws or within the complications of income tax and social security, the question was referred to Dan Tracy, president of IBEW and Robert McChesney, president of NECA as arbitrators. Meanwhile the NECA convention in San Francisco had unanimously declared a policy opposed to vacation plans. So the arbitrators, unable to agree, turned the problem back to the local contenders. This left open to legal question whether or not the 2% of labor pay roll, supposed to be set aside for the vacation fund by each employer, was collectable by union men. Paul Geary, executive vice-president, NECA, came to Oakland to persuade the chapter to resubmit the problem to the arbitrators with the release that, since the agreement had been signed before the NECA convention, action there should not influence the decision.

The arbitrators, Tracy and McChesney, on May 28, came to a conclusion that again is open to legal question and which some contractors and their customers are threatening to take into court. The decision was that "in lieu of the proposed vacation with pay plan each employer . . . shall pay as wages to the workmen . . . an amount equal to 2% of straight time earnings of each, less all lawful pay roll deductions." Such payments are to be transmitted through the local union.

In acceding to the request to resubmit the question the chapter of NECA did so with the understanding that all issues not settled in the future be submitted to the Council on Industrial Relations for the Electrical Contracting Industry, in order not again

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to be at the mercy of strike threats and arbitrary demands from the local executive board and business agent and the single decision of the IBEW president, as contained in last year's coercive agreement. The arbitrators "recommended" that future contracts contain the standard clause relating to this council as final arbitrator. This evidently was repugnant to the local unions, although it is standard practice all over the country and has promoted harmonious labor relations for years.

Since the new contract now under negotiation between these locals and the NECA branches contains this clause, as submitted by the contractors, it has become a major issue. The contractors have offered the same wage increase, from $2.25 to $2.40 per hour, which has been settled on by Los Angeles, San Francisco, Stockton, and several other localities, but these East Bay locals hold out for $2.63 an hour plus a 2%, unspecified as to what for. Because there seems little likelihood that these issues will be resolved before contract expiration, July 1, there may be a strike called. The NECA chapter has placed the whole problem in the lap of the council. What it does about it may well affect NECA membership throughout the state of California.

Colorado Company Signs Agreement With IBEW

Negotiations between Public Service Co. of Colorado and Local 111, International Brotherhood of Electrical Workers (AFL), terminated amiably with a 10-cent across-the-board raise, and other concessions in certain categories.

Under the new contract, linemen will receive $1.61 an hour; gas fitters, $1.49; turbine operators, $1.81, and line truck operators, $1.35. Sick leave and additional benefits were also incorporated.

Local 111 IBEW embraces the Denver area. Locals at Grand Junction, Boulder and Alamosa endorsed the agreement.

The union is bound by a no-strike clause.

● ELECTRICIANS in nine Boise, Idaho, electrical shops returned to work June 16, following acceptance of a wage increase to $2 an hour and a 1% contribution to the union's benefit fund, offered by the contractors. The agreement ended a 15-day tieup of the nine shops. Four other electrical shops employing workers from local 291, signed new contracts on June 1 granting 25-cent hourly wage increases.

SEATTLE TELLS STAND ON DAM PURCHASE

If the city of Seattle buys the power distribution system of the Puget Sound Power & Light Co. in the Seattle area, it may also buy the company's Rock Island Dam and power plant on the Columbia River, city officials have announced.

Previous tentative purchase plans had included only the company's Snoqualmie Falls and White River generating plants, plus the distribution system. These plants produce only about 80,000 kw., however, and expansion is not feasible.

The Rock Island plant, if purchased, could be expanded to triple its present capacity of about 80,000 kw. with four generators. It is much farther away from Seattle than the Snoqualmie Falls and White River plants—more than 100 miles as compared to less than 30.

● WASHINGTON WATER POWER Co. won a condemnation suit brought by Northeastern PUD of Colville, Wash. A $2,500,000 valuation was set on the firm's property in the area, reportedly close to the company's estimate, compared to the $780,000 value asked by the PUD.

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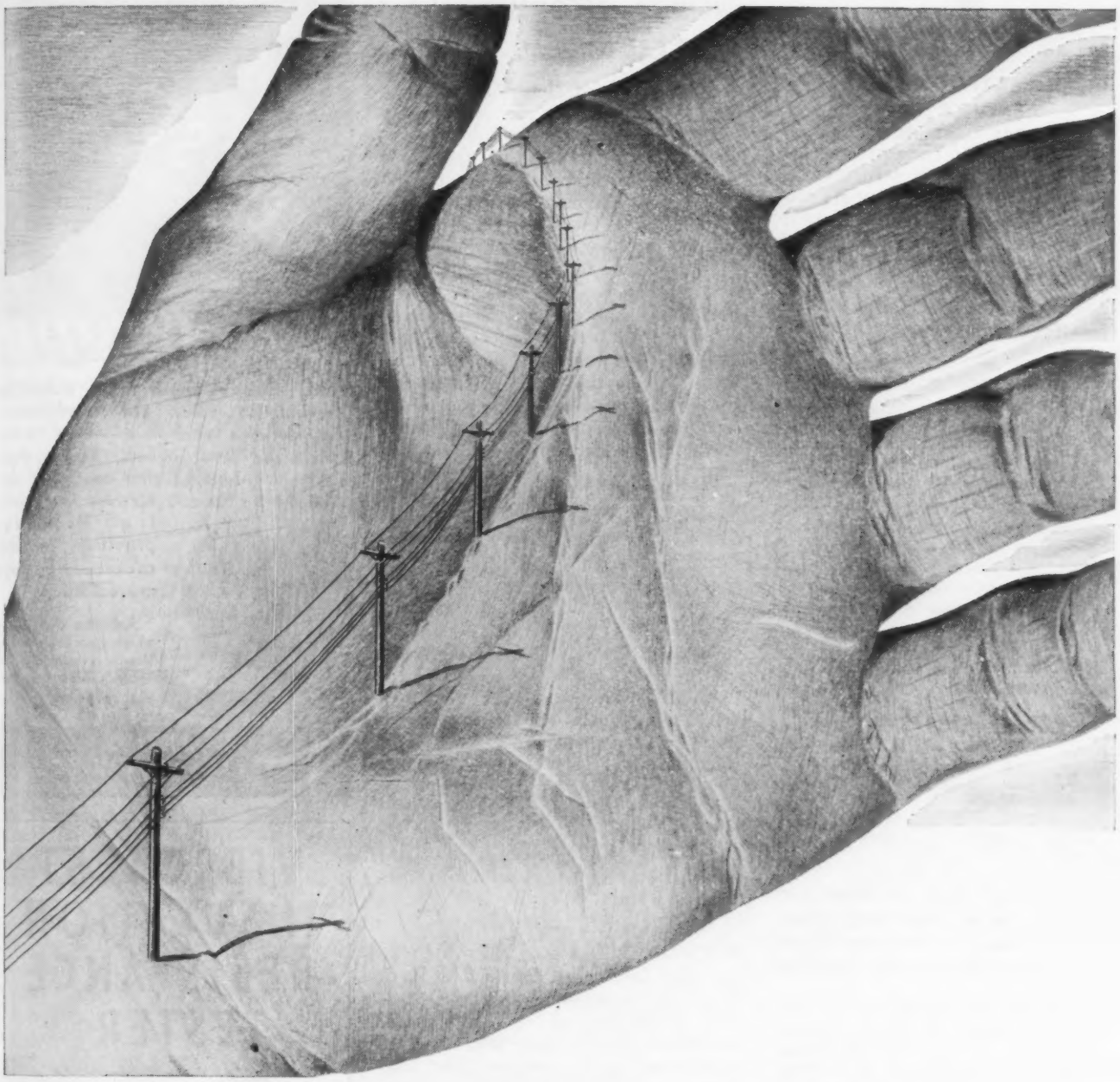

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ENGINEERS RECOMMEND HELLS CANYON DAM

Construction of Hells Canyon Dam on the Snake River eleven miles up stream from Lewiston, Idaho, to reduce downstream flood in the lower Columbia River area and boost Pacific Northwest power output by close to 1,000,000 kw. has been recommended by the Corps of Engineers. The recommendation was announced by Col. Theron D. Weaver, North Pacific Division engineer in Portland.

The project, estimated to cost $358,400,000, has been surveyed and reported on by the Corps of Engineers in accordance with Congressional directives. Colonel Weaver termed it a fully considered project, not a "quickie."

The proposed dam would consist of a concrete gravity structure about 710 ft. high with a power house having a capacity of 850,000 kw. in ten units and provisions for four additional power units. The reservoir created by the dam would be some 89 miles long. Useful storage in the reservoir would be 3,280,000 acre ft.

Colonel Weaver described the project as a part of a comprehensive program for coordinated development of the Columbia River basin. A report covering the entire program will be completed by the Corps of Engineers later this year.

The Bureau of Reclamation also has made recommendations for construction of a dam in Hells Canyon.

● CANADIAN GENERAL ELECTRIC CO. has been awarded a contract by B. C. Power Commission for the fabrication and installation of two 12,500-kva. generators at the new Whatshan-Arrow Lakes hydro project. The contract price of $348,535 includes spare parts, air coolers and certified factory tests. Original basic bid by the firm was $315,000. First unit will be delivered in 18 months, the second in 19 months.

● UTAH POWER & LIGHT CO. has signed a power interchange agreement with the city of Bountiful, Utah. A crew is installing automatic air brake switches at a nearby UP&L substation where 44,000-volt power will be transformed to 4,000 volts for delivery to the city. The interchange contract becomes effective Oct. 15 and is for one year, with clause for optional renewal.

● SIERRA PACIFIC POWER CO. has secured FPC authorization to issue and sell through competitive bidding $3,500,000 of first mortgage bonds, due April 1, 1978.

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OPPOSITION HEARD ON TWO PROJECTED DAMS

Army Engineers are working on a "piece-meal basis to turn northwestern Montana into a big reservoir for the benefit of down-stream states," Gov. Sam C. Ford of Montana charged at a hearing conducted in Hot Springs, Mont., by U. S. Engineers on proposed construction of a $175,000,000 multi-purpose dam on the Clark Fork of the Columbia River near Paradise.

He urged the Army Engineers and Reclamation Bureau to "get together on a comprehensive, integrated and co-ordinated plan of development."

Other opposition to the dam came from representatives of the Flathead Indian reservation, who said the reservoir would flood part of the reservation, in violation of a treaty made almost 100 years ago; sportsmen, who said the dam would ruin wildlife and recreation facilities, and the National Park Service, which protested the dam would flood part of the National Bison Range.

Col. L. W. Hewitt, district Army engineer at Seattle, said the dam is necessary to alleviate a "serious power shortage" in northwestern states and also is needed for irrigation, flood control and navigation. The structure would be an earthfill dam forming a reservoir of 6,500,000 acre ft. It would have an installed power capacity of 576,000 kw.

At another hearing, at Kalispell, construction of the proposed $95,000,000 Glacier View Dam on the Flathead River's north fork was opposed by sportsmen, wildlife groups and the National Park Service. This dam would be 400 ft. high, 2,100 ft. at the crest, also of earthfill construction, and would impound more than 3,000 acre ft. of water.

Washington PUD Takes Over Puget Sound Properties

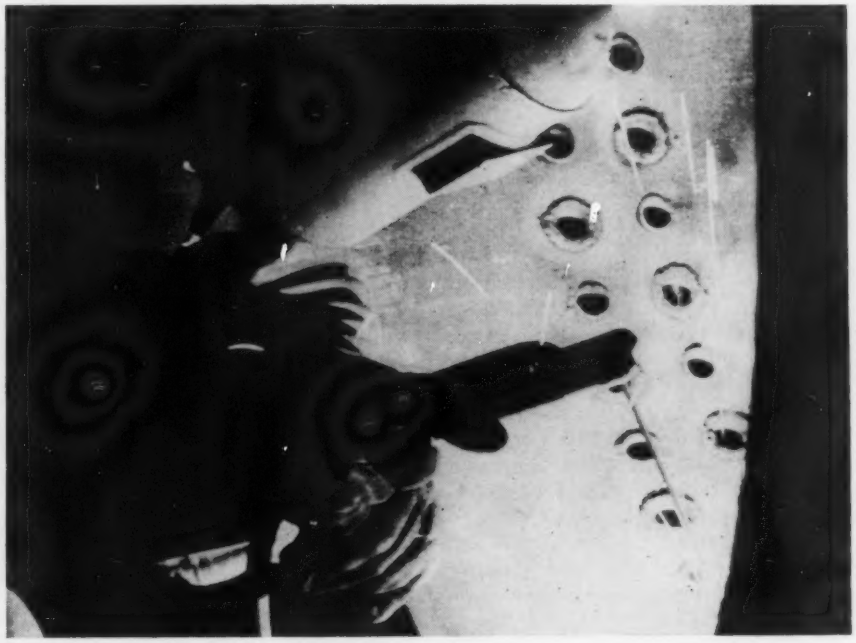
Mason County PUD No. 1, Shelton, Wash., has taken title to the electric distribution system of Puget Sound Power & Light Co. in that county by payment of $200,000. This is the second recent acquisition of company property by a PUD, the Cowlitz County district having taken over lines recently at a cost of approximately $2,000,000.

Negotiations between the company and two other southeastern Washington counties are meeting with obstacles. Grays Harbor County PUD commissioners have voted to launch condemnation proceedings, rejecting the price tag of $1,100,000 as too high. A small Pacific County deal is being held up.

Engineers representing a number of other PUDs, which are acting together to purchase company properties, and engineers representing the city of Seattle are undertaking a joint study of various technical problems involved in purchase proposals.

● McPHAIL Engineering Co. of Tacoma has submitted a low bid of $188,700 to Pacific Power & Light Co. for construction of a 41.8-mile section of new power line to central Oregon. F. L. Beadle, project engineer for the company, said the job is part of a 59-mile company project to provide added sources of power for the Bend-Redmond-Prineville-Madras area.

● THE DOUGLAS ELECTRIC Cooperative, Roseburg, Ore., has received approval of a loan of $565,000 from the rural electrification administration to finance construction of approximately 150 miles of new line construction. The new lines will serve rural areas in the lower Umpqua valley.



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NORTHWEST UTILITIES TAKE FLOOD IN STRIDE

Utilities of the Pacific Northwest survived the recent devastating floods in that area with remarkably small amount of damage and impairment of service. Equipment was kept operating under most adverse conditions in many instances. Where lines went down from weakened structures, repairs were quickly made. Heaviest damage to power systems seems to have been to the Okanogan PUD in Methow Valley in north central Washington. Facilities were virtually wiped out and farms and communities left without service. Most of the PUD's 13-kv. line from Peteros to Twisp will have to be rebuilt.

A Washington Water Power Co. line over the Columbia east of Wenatchee went out but was replaced after three days. Other WWP lines further east also were replaced. Damage to Puget Sound Power & Light properties was reported minor. High water virtually halted power production at the company's Rock Island plant on the Columbia, but did no damage to structures. Utilities in the Portland area suffered comparatively minor damage.

Twenty per cent power curtailment from the Bonneville and Grand Coulee plants, due to high tail water, was alleviated when the Troutdale aluminum plant near Portland shut down because of high water. This reduced power pool load by 141,680 kw. One major interruption occurred to the Northwest Power Pool when lightning struck in such fast succession that lines cascaded out and the pool split into several pieces. Frequency was down to 35 cycles in one part and up to 65 cycles in another for a short period of time. Pool members consider it remarkable that there was so little trouble considering the protracted flood of such major proportions. Flow of the Columbia at Vancouver exceeded 1,000,000 cu. ft. per second, only slightly under the great flood of 1894. Approximately 500,000 sec. ft. went over the dam at Grand Coulee, but the dam was designed to spill one million sec. ft., so that there was no real danger. Reports that the dam was damaged proved unfounded. There was violent churning of boulders at the toe of the concrete spillway apron, but this was normal.

The most spectacular case of an industrial plant continuing to operate despite flood conditions was that of the Alcoa aluminum plant at Vancouver. The accompanying air view shows the 230-kv. switchyard under several feet of water, but equipment continued to operate and the plant remained in production.

Alcoa aluminum plant substation at Vancouver from the air showing (upper) general view of switchyard and (lower) submerged conditions under which electrical equipment operated to keep plant in production. Alcoa-Vancouver produces 170 million pounds of aluminum yearly. Continuous power demand is 172,000 kw.

● San Diego Gas & Electric Co. received a Silver Anvil, top award, from the American Public Relations Assn. for "the most effective use of public relations technique and procedure" in its 1947 annual report (E West, p. 112) The company's 1946 report was awarded a Silver Oscar by *Financial World*, as the best utility report. Both reports were produced under supervision of Forrest M. Raymond, advertising superintendent.

● Spenard PUD No. 1 of Anchorage, Alaska, has asked the federal court in that city to grant an injunction halting the city of Anchorage from extending its power lines into the Spenard area, south of the city. The Chugach Electrical Assn., a cooperative set up under the REA system, has secured a $560,000 REA loan to set up a diesel power plant and distribution system to serve an area of 40 square miles in the Spenard district. The $560,000 is the first sum of a $1,800,000 loan requested for the project, according to Attorney J. L. McCarrey Jr., counsel for the PUD. Victor Rivers, Anchorage civil engineer, is in charge of the work.

● Offer has been made to the city of Courtenay, B. C., by the British Columbia Power Commission for purchase of the municipal street lighting system. The commission offers 20 annual payments of $18,000, $2,000 less than the original figure suggested by the city. Purchase would be made April, 1949, and the commission has agreed to convert the system to 60-cycle operation at the earliest practicable date.

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COWLITZ DAM SEEN AS THREAT TO SALMON INDUSTRY

Proposal of Tacoma, Wash., to build two hydroelectric dams on the Cowlitz River south of the city has met opposition from the Washington State Game and Fisheries directors on the ground that the river is of great value to salmon fishery.

Value of fish produced by the Cowlitz River above the proposed Mayfield Dam site is estimated at $551,710 annually, Don Clarke, director of the State Game department and Milo Moore, director of the Fisheries department, said in a joint statement. Clarke and Moore declare the dam would block 1,400 sq. mi. of watershed with several important tributaries.

"It is evident from existing information that there are at the present time other power sites that will produce the required power with little effect upon our great natural resource, fisheries," the state officials said in registering their protest.

C. A. Erdahl, Tacoma commissioner of public utilities, replied that permits for construction on the Cowlitz call for an adequate solution to the fish problem. The city had investigated other sites, he said, but had found them uneconomical.

"The U. S. War Department in 1930 recommended the Cowlitz as well adapted to power development, with 300,000 kw. of power available 90 per cent of the time, and has indicated it plans a multi-purpose development if Tacoma does not build," Erdahl said.

Power produced from the river would have an annual value of $8,000,000 Erdahl declared.

● CONTINUING a work - scholarship program started last year to encourage greater enrollment in electrical engineering courses and choice of electric work as a career, Portland General Electric Co. has selected eleven Oregon State College students for summer job scholarships. The scholarships were awarded outstanding sophomores and juniors chosen by a joint committee of the faculty and the company. The students will be assigned to the company's office, shop and operating divisions.

● FPC has authorized Mountain States Power Co. to issue $3,500,000 of 3⅜% first mortgage bonds, due 1978, and 20,000 shares of 5% cumulative preferred stock of $50 par value a share. Bonds and stock will be sold to John Hancock and Massachusetts Mutual Life Insurance companies.

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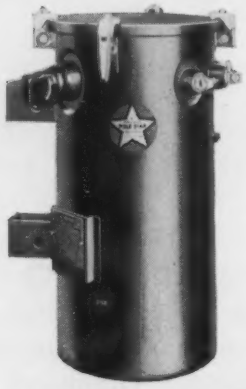

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NEWS ABOUT PEOPLE

● EDWARD P. EARDLEY has been named chief engineer, division of power, U. S. Department of Interior, succeeding George W. Hamilton, who resigned. A native of Utah, Eardley was graduated from the University of Utah. From 1940 to 1941, he was city manager of Burley, Idaho. He most recently has been employed as representative of the rural electrification administration with TVA.

● WALTER D. HOWELL, Berkeley district manager of Pacific Gas and Electric Co. for the past two years, has been promoted to East Bay division sales manager for the company, succeeding LEW GALBRAITH, retired. H. V. WORTHINGTON, local manager at San Leandro, will take over the Berkeley position.

● R. W. JACKSON of the General Electric News Bureau in Schenectady, N. Y., has been appointed Western representative for General Electric's advertising and publicity department, succeeding F. Lowell Garrison who recently became radio sales manager for the San Francisco district of the General Electric Supply Corp.

● RICHARD C. LOWRIE, for many years a detail engineer for power plant construction for Idaho Power Co., has been appointed resident engineer at the company's $12,000,000 hydroelectric project now under construction on the Snake River near Bliss, Idaho.

● L. M. KLAUBER, president of San Diego Gas & Electric Co., was elected a director of the California State Chamber of Commerce at its annual meeting in Los Angeles. A past president of PCEA, Klauber is a director of Solar Aircraft and other companies.

● CHARLES F. DALZIEL, associate professor of electrical engineering, University of California, will conduct a summer course of hydroelectric inspections. Included will be a three-week tour of the state's major power developments.

● COL. F. L. BEADLE, recently retired from the Corps of Engineers, has been named project engineer on the $1,400,000 transmission line which the Pacific Power & Light Co. is building in central Oregon.

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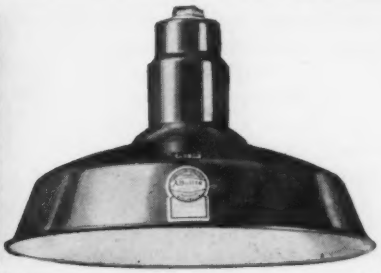

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Don't overlook this man if you have a knotty problem involving wire or cable. He's the Paranite representative from any of the strategically located points shown above. As a specialist in applying the correct solution to wiring problems from Paranite's diversified line, he has helped smooth wrinkles from many brows. Or, if it is something special, he'll work with you and Paranite engineers and production men in coming up with the right answer.

If he can be of help, contact through your local wholesaler, the nearest Paranite office, or Ft. Wayne.

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PARANITE WIRE AND CABLE

Division of ESSEX WIRE CORPORATION • FORT WAYNE 6, INDIANA

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WAREHOUSES* AND SALES OFFICES: *Atlanta, Ga.; *Chicago, Ill.; Cleveland, Ohio; Dallas, Texas; *Detroit, Mich.; *Kansas City, Missouri; *Los Angeles, Calif.; *Newark, N. J.; Philadelphia, Pa.; *Portland, Oregon; *St. Louis, Missouri; *San Diego, California; *San Francisco, California

● HARRY M. HALVORSON has been assigned to contacting home builders, contractors and architects in the Portland area for the Northwestern division of Pacific Power & Light Co. Halvorson will devote his time to electric service requirements and the promotion of adequate wiring.

● R. D. "Dewey" JEFFERSON, Boise, former superintendent of substations for Idaho Power Co., retired June 1 after nearly 46 years of continuous service to that and predecessor companies, topping the list of old timers in years of service. Jefferson will be succeeded by L. S. GOSSI, former construction foreman of mobile survey.

Deaths

● FRED R. GEORGE, engineer of electric operation for Pacific Gas and Electric Co. before his retirement, July 1, 1946, died of heart failure, in Oakland, June 1. Although retired he retained active interest in the industry, attending its meetings, apparently in fine health. He had started with a predecessor of PG and E, Mutual Electric Light Co., in San Francisco, as an oiler in 1901 after graduation from University of Southern California. He developed the central load dispatching system in 1906 and from 1921 was engineer of electric operations.

● SAMUEL P. MACFADDEN, former executive vice-president of Puget Sound Power & Light Co., Seattle, died on May 23, at the age of 53. A native of Texas, Mr. MacFadden came to Seattle in 1930 as vice-president and director for the Puget Sound Power & Light Co. and its subsidiaries. He became executive vice-president for the company in 1942, resigning in 1946 due to ill health, but continued as a consultant. He was a past president of the Northwest Electric Light & Power Assn.

● RAYMOND GUY LITTLER, former owner and manager of the West Coast Engineering Co., Portland, died at his home in Portland early in May. During World War II he was in charge of the electrical engineering details of the government ammunition depot at Hermiston, Ore., and later was named chief electrical engineer of the Oregon Shipbuilding Corp. He was a member of the AIEE.

● ELMER COX, the pioneer electrical contractor dealer of Santa Cruz, Calif., met death in an accident late in May. He was aged 65 and had operated Cox Electric Co. from before the first World War.

NOTES ON THE TRADE

● SMOOT-HOLMAN Co. this year celebrates its 33rd year as a West Coast manufacturer. The firm was established in 1915 by C. E. Smoot, president, and G. W. Holman, vice-president. Main plant of the company is located in Inglewood, Calif., with a branch and warehouse in San Francisco and offices in principal Western cities.

● GIVEN MFG. Co., Los Angeles, has appointed Millard F. Foist as assistant sales manager. He will work with Fred Kassler, sales manager of the firm, in dealer and distributor sales promotion and merchandising.

● MARVIN S. BANDOLI, formerly in the wholesale appliance business in southern California, has been appointed general sales manager and vice-president of the Tracy Manufacturing Co., Pittsburgh, Pa.

● E. D. BULLARD Co., San Francisco, pioneer in industrial safety equipment, this year celebrates its 50th year in business.

● FRANCES ALEXANDER, for three years home service director for Harper-Meggee Inc., Portland, has joined Bendix Home Appliances Inc., as Western regional home service director.

● JOSEPH W. DOAN, former manager of the appliance section of Broadway Stores, Los Angeles, has been appointed appliance sales manager of the Pacific Region, Frigidaire Division of General Motors.

● D. B. KIFT, executive vice-president of Tuttle & Kift Inc., will establish an office in Los Angeles for the firm to service the entire West Coast territory. The office was scheduled to be opened by July 1.

● DISTRIBUTORS Inc., Seattle, held open house beginning June 14 for a week at its new location on 9th & Harrison Sts.

Several cutaway working models of the Smith-Kaplan adjustable-blade runner are being made for U. S. universities desiring to use them for instruction. Ross L. Mahon, Pacific Coast representative for S. Morgan Smith, manufacturers of the units, has shown this model before several Western groups. Moving parts illustrate clearly operation of the assembled runner, used at Bonneville and other generating and pumping installations in the United States and in South America

DIRECTORY ADDITIONS

DIRECTORY OF MANUFACTURERS

AUSTIN CO., THE M. B., Northbrook, Ill. —Hauck & Fowler, 324 Fifth St., San Francisco 7.

BERNS MFG. CORP., Chicago, Ill.—Frank H. Bran Co., 607 East 6th St., Los Angeles; 894 Folsom St., San Francisco.

COMMERCIAL ENCLOSED FUSE CO., Hoboken, N. J.—P & G Factory Agents, 1355 Market St., San Francisco.

C-O-TWO FIRE EQUIPMENT CO., Newark, N. J.—F. W. Keyes, 3071 East 12th St., Los Angeles 23; B. S. Allen, 977 Mission St., San Francisco 3.

FISHER-ARMOUR CO., Chicago, Ill.—Walter E. Brand Co., 1855 Industrial St., Los Angeles 21; W. A. Robbin Co., 6228 36th Ave., N.E., Seattle.

LUMIDOR MFG. CO., Los Angeles, Calif. —P & G Factory Agents, 1355 Market St., San Francisco.

OSTER MFG. CO., JOHN, Racine, Wis.—Oster Factory Service, 277 Eddy St., San Francisco 2; Oster Factory Service, 237 E. 4th St., Los Angeles 13.

TUTTLE & KIFT INC., Chicago, Ill.—Tuttle & Kift Inc., 5309 South District Blvd., Los Angeles.

UNITED STATES TELEVISION MFG. CORP., New York City—Fred S. Campbell Co., 1268 Mission St., San Francisco.

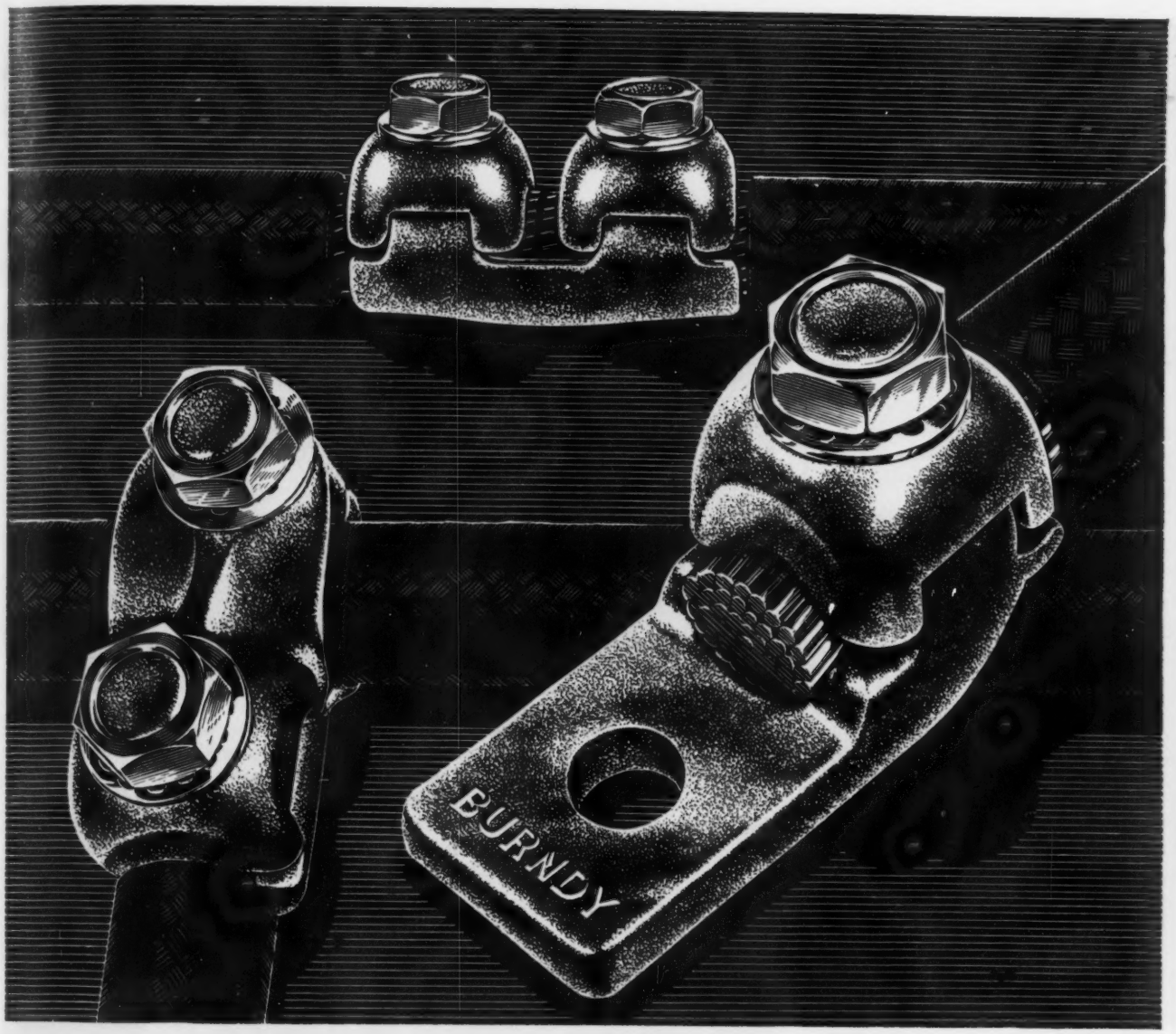
DIRECTORY OF WESTERN REPRESENTATIVES

DENVER COLO.: Sales Engineers Inc., 11th & Walnut.

HOLLYWOOD, CALIF.: George J. Heller, P. O. Box 1865.

SAN FRANCISCO, CALIF.: Frank H. Bran Co., 894 Folsom St.; Fred S. Campbell Co., 1268 Mission St.; Electric Agencies, Inc., 171 Stillman St.; Hauck & Fowler, 324 Fifth St. (formerly Ernest F. Hauck Co., and M. L. Fowler Co.); Manufacturers Marketing Service, Steve Babcock, 2342 Franklin St.

SEATTLE, WASH.: W. A. Robbin Co., 6228 36th Ave., N.E.



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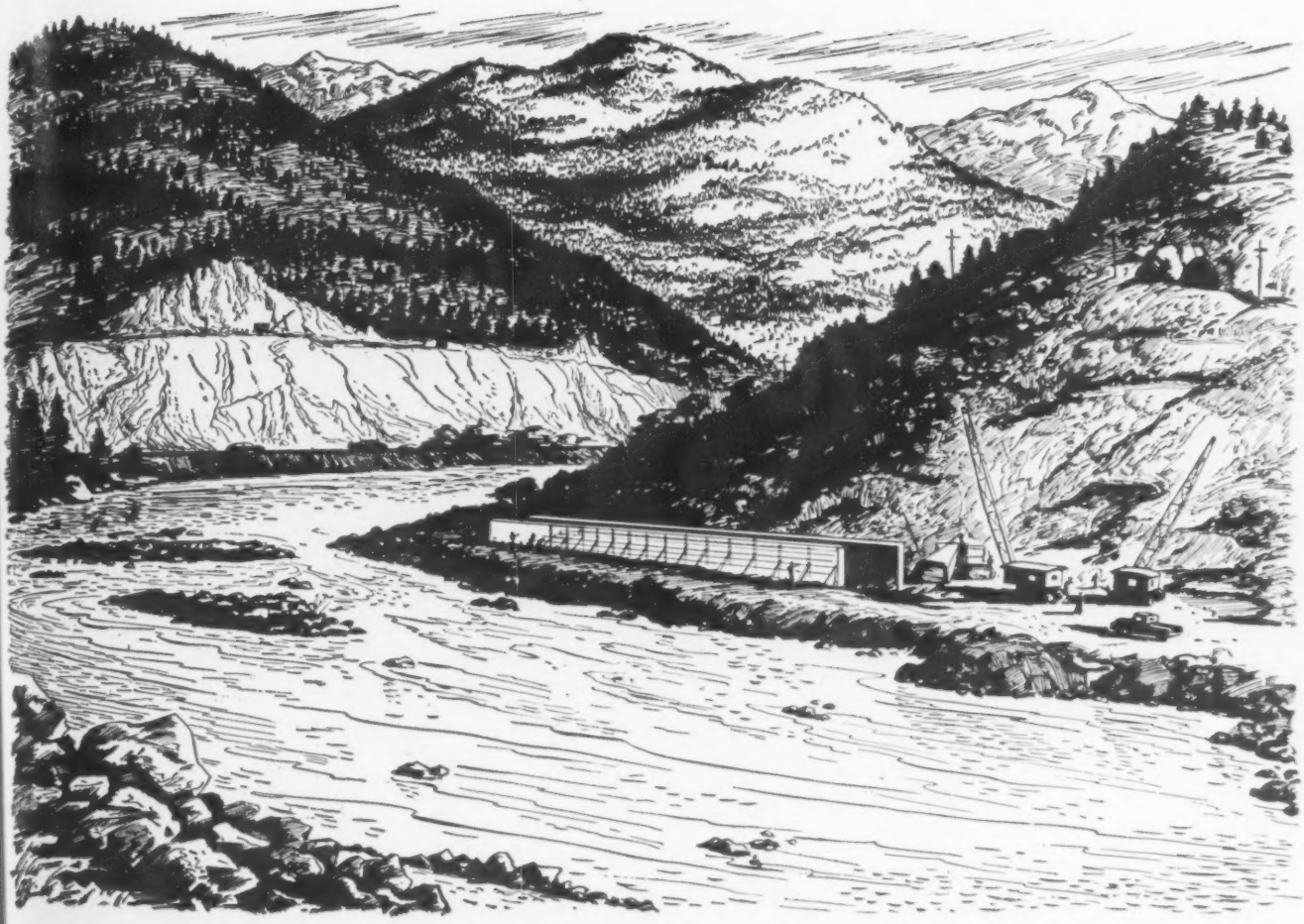
PROFILES

Pictured during General Electric's Adirondack Power Sales Conference are (left to right) G. N. Hawley, manager power sales, Southern California Edison Co.; J. C. Porter, General Electric Pacific district sales engineer; Mrs. N. R. Sutherland and N. R. Sutherland, vice-president, Pacific Gas and Electric Co. First of its kind, the conference brought together 125 utility executives from all parts of the U. S. to discuss with G-E sales, engineering and research personnel ways and means of helping industry through increased electrification

Some of the members of Northwest utility accounting departments inspect an IBM billing installation at Washington Water Power Co. during the recent Accounting Section Conference of the Northwest Electric Light & Power Assn. Shown (left to right) are: R. F. Bauerle, IBM, San Jose; Miss Roberta Dockendorf, Washington Water Power Co.; M. R. Wilkinson, Pacific Power & Light; E. W. Bredemeier, Portland General Electric; J. E. Winton, Washington Water Power, section chairman. The Spokane installation is one of the fastest in the country from meter reading to mailed bills, according to those who have seen it

How to dam a mountain river



Feather River Trout are getting a new stream bed temporarily, as the first step in a power project that will soon create 270,000 new electrical horsepower for Northern and Central California. This is the site of P. G. and E.'s Rock Creek Diversion Dam, near Belden...and work is going ahead rapidly with interesting engineering tricks speeding progress.

While the river splashes in its new channel, a small rock dam keeps the main river bed dry. Once the large dam is complete, water to turn generators will be carried to a power-house down stream through giant tunnels.

Architect's sketch shows how the dam will look. It's one of two dams on the Feather River which will start delivering power by the Fall of 1949 . . . Meanwhile, the P. G. and E. is rushing all construction at a rate of more than $10,000,000 a month.

Work never stops on our power-building program

P·G·and E·

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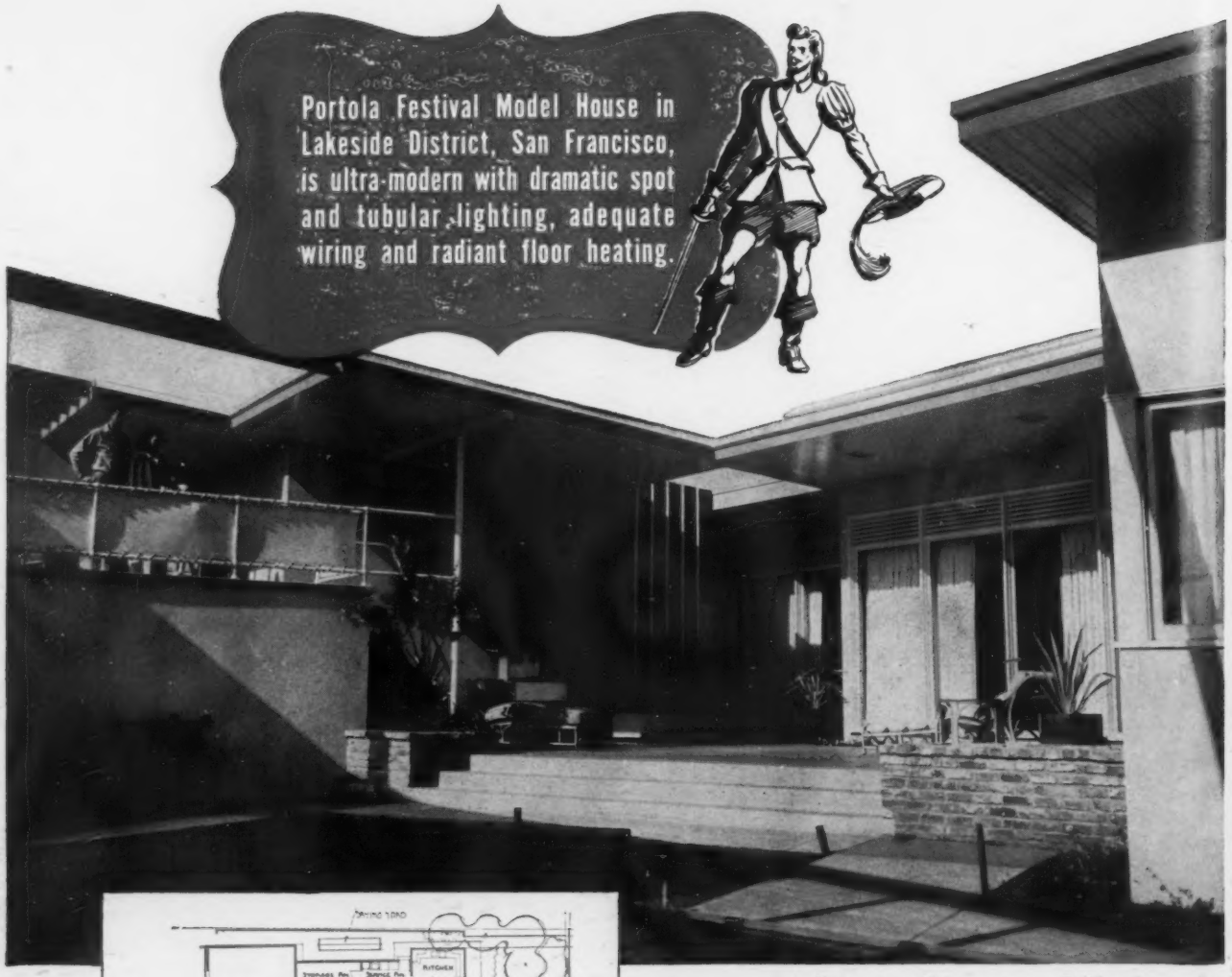
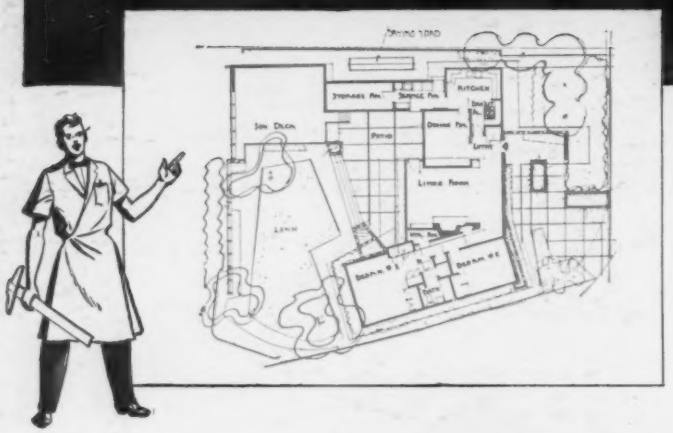
Portola Festival Model House in Lakeside District, San Francisco, is ultra-modern with dramatic spot and tubular lighting, adequate wiring and radiant floor heating.



Architect—Angus McSweeney. *Builder—Stoneson Bros.*



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When people by the thousands visit model homes they SEE and are INSPIRED by adequate wiring, better lighting, latest-model appliances and equipment displayed at their best. And as these people thoughtfully wander through each room, they gain new ideas or reaffirm old ones for better living...for modern *electriliving.* Capitalize on the model homes in your community while they are being visited, admired and talked about. You will find they give you extra help in selling the newest and best in wiring, lighting and appliances.

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